EXHIBIT R-2, RDT&E Budget Item Justification Sheet								DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**		PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**				PROJECT NAME AND NUMBER Navy Facilities System/Y0995				
COST ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	**1.927**	**1.807**	**1.728**						**Cont.**	
Navy Facilities System/Y0995	**1.927**	**1.807**	**1.728**						**Cont.**	**Cont.**
RDT&E Articles Qty	**5**	**5**	**5**						**NA**	**NA**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides the Navy with new civil engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available resources on satisfying facility requirements where the Navy is a major stakeholder. There are no test validated Commercial off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy Science and Technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Real Property Maintenance (RPM) Programs. Project Y0995 is addressing four Navy facility requirements during the fiscal years FY 2000 through FY2002: The High Performance (HP) Magazine, Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Real Property Maintenance (RPM) Backlog, and the Modular Hybrid Pier. The execution of this program is consistent with the findings and recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities."

B. (U) PROGRAM CHANGE SUMMARY:	FY 2000	FY 2001	FY 2002
(U) FY 2001 President's Budget:	1.974	1.824	1.719
(U) Appropriated Value:	1.985	1.824	
(U) Adjustments to FY 2000 Appropriated Value/FY 2001 President's Budget			
a. Across-the-Board Reduction	-0.011	0	0
b. DON adjustments	-0.047	-0.017	0.009
(U) FY 2002 PRES Budget Submit:	1.927	1.807	1.728

CHANGE SUMMARY EXPLANATION

(U) FY00: Funding: Reflects Across-the-Board reduction of $11K and DON adjustments of $47K.

(U) FY01: Funding: Reflects .7% Pro Rata reduction of $13K and a$ 4K recission reduction.

(U) FY02: Funding: Reflects POM reduction of $2K; DON NWCF Rate increase of $35K; OSD NWCF Rate reduction of $24K.

(U) Schedule: One year delay in completion of one Real Property Maintenance (RPM) technology validation.

(U) Technical: N/A

C. (U) OTHER PROGRAM FUNDING SUMMARY: Provided in Project Y0995 R-2a

D. (U) ACQUISITION STRATEGY: Provided in Project Y0995 R-2a

E. (U) SCHEDULE PROFILE: Provided in Project Y0995 R-2a

EXHIBIT R-2a, RDT&E Project Justification							DATE: June 2001 **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**		PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**								
COST ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Navy Facilities System/Y0995	**1.927**	**1.807**	**1.728**						**Cont.**	**Cont.**
RDT&E Articles Qty	**5**	**5**	**5**	**6**	**TBD**	**TBD**	**TBD**	**TBD**	**NA**	**NA**

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides the Navy with new civil engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available resources on satisfying facility requirements where the Navy is a major stakeholder. There are no test validated Commercial off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy Science and Technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Real Property Maintenance (RPM) Programs. This project is addressing four Navy facility requirements during the fiscal years FY 2000 through FY2002:

(U) THE HIGH PERFORMANCE (HP) MAGAZINE.

(U) Based on current magazine technologies, substantial land areas within Naval activities cannot be used for inhabited buildings in order to satisfy Explosives Safety Quantify Distance (ESQD). The converse is also true, the Navy is not able to locate new magazines where they are needed because of the proximity of inhabited buildings. This effort enables a quantification of the specific hazard scenarios capable of causing ordnance detonation, an improved capability to model an ordnance explosion in a magazine, and the innovative use of energy absorbing construction materials to provide a new magazine concept. The new magazine will have smaller ESQD arcs that are based on a Maximum Credible Event (MCE) that is not the detonation of the entire magazine but rather the detonation of the contents of one, much smaller, storage cell within the magazine. For a typical magazines with Net Explosive Weight (NEW) capabilities of 250,000 pounds, the allowable ordnance storage density is increased from 370 pounds/acre to 2,222 pounds/acre. In addition, the number of incompatible classes of ordnance that can be stored in the same magazine is incased from none to eight. This new magazine will also lead to lower operational costs for the Receipt, Segregation, Storage, and Issue (RSSI) of ordnance and, for some activities, a reduction in the number of magazines required to accomplish their mission.

(U) WATERFRONT FACILITIES REPAIR AND UPGRADE.

(U) Over 75% of the Navy's waterfront facilities are over 42 years old. They were designed for a service life of no more that 25 years and to satisfy the mission requirements existing at that time of construction. The reinforced concrete used to construct nearly all of them requires costly and repetitive repairs. In addition, to accomplish more pier side ship maintenance and thus reduce drydock costs, these piers must be strengthened to support concentrated crane loads up to 110 tons when they were designed for no concentrated loads. This effort new materials and design methods to extend the service life of existing waterfront facilities by an additional 15 or more years, and a new method to cost effectively upgrade the pier load capacity without resorting to demolition and replacement. Specific benefits include increasing the durability of concrete pier repairs from 3 to 15 +years for conventional concrete patches and composite enhanced repairs respectively, new longer-lasting low-maintenance fendering systems that eliminate the need for the frequent replacement of timber piles, a new Impulse Load Method (ILM) for accurately and quickly determining the vertical load capacity of piers and wharves, a new Swinging Weight Deflectometer (SWD) technique to determine the lateral stability of piers for earthquake forces and docking ship's impact. In total, for $1-2M of repairs and upgrades per pier, using this new technology, $50M for demolition and replacement is avoided.

EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001 **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**	PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**	PROJECT NAME AND NUMBER Navy Facilities System/Y0995

(U) FACILITY TECHNOLOGIES TO REDUCE THE REAL PROPERTY MAINTENANCE (RPM) BACKLOG.

(U) The Real Property Maintenance (RPM) costs to correct critical facility deficiencies are over $2.0B as reported in the FY 1995 Annual Inspection Summary (AIS). Current Navy RPM funding levels are insufficient to prevent the continued growth of the backlog of mission and safety critical maintenance and repairs. This effort will demonstrate and clearly validate the cost and reliability of advanced technologies in order to assure their acceptance and for implementation in traditionally conservative public works and maintenance and construction industries. The effort will accelerate the validation, commercialization, and wide-spread implementation of the facility technologies urgently required to reduce the cost of deficiencies in the Navy's RPM backlog by reducing initial construction costs up to 20% and facility components with service lives that are up to 25 years longer.

(U) MODULAR HYBRID PIER.

(U) The Navy is faced with the necessity of recapitalizing a large portion of its waterfront infrastructure over the next several decades. The Modular Hybrid Pier initiative develops and validates innovative material and design technologies for a mission-flexible waterfront infrastructure characterized by significantly reduced life cycle costs and increasing mission flexibility. The concepts validated by this project's Waterfront Facilities Repair and Upgrade initiative will enable the Navy to economically extend the useful service life of many existing piers and wharves. While reducing the need for immediate replacement, eventual replacement will be required. Emerging innovative materials technologies, particularly those that will transition from the Navy's Exploratory Development (6.2) Research Program, can provide a new capability to design replacement structures that have a comparable initial cost yet have far less maintenance and repair cost. Use of composite materials for appurtenances and high strength light-weight concrete for structural elements will produce structures that have twice the structural service life of the structures that they will replace. Modular design will enable off-site fabrication that will shorten the duration and lower the cost of the on-site construction. Modular design will also facilitate change-out of components to repair damage or to modify structure geometry or capacity to adapt to future changes in ship designs. An economic analysis has shown that a modular hybrid pier will have a Net Present Value (NPV) cost that is $8M less over its service life than that for a conventional structure constructed on steel-reinforced concrete.

1. (U) FY 2000 ACCOMPLISHMENTS:

(U) ($0.185M) The High performance (HP) Magazine - Completed design of HP Magazine security system and obtained approval from DOD C3I that system meets requirements of DOD Directive 500.76M for storage of conventional AA&E. Completed definitive design for explosives safety features. Completed draft revisions to DOD Standard 6055.9 to add HP Magazine definition, siting criteria and ordnance groups. Revisions were approved by Department of Defense Explosive Safety Board (DDESB) at the January 2000 meeting.

(U) ($0.942M) Waterfront Repair and Upgrade - Initiated repair and strengthening of SUBASE Bangor Marginal Wharf using advanced composite material systems to validate performance in cold/wet environment.

(U) ($0.800M) Real Property Maintenance (RPM) Backlog Reduction - Initiated Jet-exhaust-resistantpavements at NAS Oceana for F18s. Initiated Full scale field test at NAS Roosevelt Roads, NAS Dallas/Fort Worth to validate performance of advanced Hangar Floor Coatings and supporting diagnostics. Completed data collection and initiated evaluation of Roofing Management System at NWS Charleston. Initiated large scale field test of concrete, containing an high percentage of fly ash in lieu of cement at NAS Point Mugu. Completed testing of commercially available void detection techniques for airfield pavement safety. Initiated field tests of advanced composites (fiber reinforced polymer (FRP)) building apurtenances for validating performance in exterior of marine structures. Initiated development for automating imaging and data processing for Airfield Pavement Condition Index (Auto PCI) surveys.

EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001 **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**	PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**	PROJECT NAME AND NUMBER Navy Facilities System/Y0995

2. (U) FY 2001 PLAN:

(U) ($0.671M) Waterfront Repair and Upgrade - Complete strengthening and performance testing of SUBASE Bangor Marginal Wharf. Develop documentation for implementation of new repair and strengthening (vertical & lateral) concepts by both NAVFAC and transfer of know-how to private sector. Initiate validation testing of Swinging Weight Deflectometer (SWD), the only device that measures lateral stability of piers.

(U) ($1.136M) Real Property Maintenance (RPM) Backlog Reduction - Complete performance testing of : precision condition survey system for Roof Management, Non-skid and high light reflectance safety coatings for A/C Maintenance Hangar Floors, Urethane Coating that cure in the presence of atmospheric moisture, extremely durable and more economical concrete for airfield and waterfront applications using high content of fly-ash substitute for cement, composite appurtenances for structure. Initiate validation testing of rapid scanning sensor for detecting voids (and weakness) under airfield pavements. Initiate the application of intelligent systems for measuring maintenance condition readiness of operating shoreside facility systems. Re-plan downstream programs to meet changes in priorities.

3. (U) FY 2002 PLAN:

(U) ($0.304M) Waterfront Repair and Upgrade - Complete validation testing and evaluation of Swinging Weight Deflectometer (SWD methods.

(U) ($0.930M) Real Property Maintenance (RPM) Backlog Reduction - Complete testing of advanced (more rapid and reliable) methods for airfield pavement subsurface void detection. Initiate field validation of several emerging high durability (low maintenance) coatings for highly corrosive "splash zone" environments. Initiate validation testing of composite applications in high temperature and high stress and cyclic fatigue applications for utilities, engine testing, etc. Initiate construction and maintenance quality control technologies (intelligent systems) to assure quality in acquisitions for readiness, reliability and safety of operational facilities.

(U) ($0.494M) Modular Hybrid Pier - Initiate conceptual design of modules and major assemblies transitioning from the related 6.2 Exploratory Development Program. Conduct constructability evaluations and tests.

EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001 **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**	PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**	PROJECT NAME AND NUMBER Navy Facilities System/Y0995

B. (U) OTHER PROGRAM FUNDING SUMMARY: This project transitions waterfront facility technologies from three Navy Exploratory Development (6.2) Research Programs: PE0602121N - Ship, Submarine and Logistics Technology, PE0602234N - Materials, Electronics and Computer Technology, and PE0603712N - Environmental Quality and Logistics Advanced Technology Demonstrations. It also transitions facility technologies developed at universities under the sponsorship of the National Science Foundation (NSF), by the Building and Fire Research Laboratory (BRL) of the National Institute of Standards and Technology (NIST), and by the Constructed Engineering Research Laboratories (CERL) and Waterways Experiment Station (WES) of the U. S. Army Corps of Engineers (USACOE) when they can contribute to the solution of one of the Navy requirements being addressed by this project. The project pursues opportunities to leverage private sector investment through partnerships with private sector organizations, such as the Civil Engineering Research Foundation (CERF) and the Composites Institute (CI) of The Society of the Plastics Industry (SPI). The project pursues opportunities to leverage Navy Real Property Maintenance (RPM) and Military Construction (MILCON) investment through partnerships with RPM and MILCON program and project managers .

C. (U) ACQUISITION STRATEGY: This project is categorized as Non-ACAT (Non Acquisition). The know-how produced from this project enables the safe and cost effective application of emerging/advanced technology concepts and products: 1) specifying or describing the performance, 2) enabling innovative design applications, 3) enabling quality control/quality assurance during constructions, 4) enabling reliability and maintainability during operations, and 5)developing lifecycle cost projections and environmental sustainability life cycle data for Navy policy guidance and criteria serving the Navy Real Property Maintenance (RPM) and Military Construction (MILCON) and other engineering/acquisition programs. The data from this program enables earliest and safe utilization of advanced technology for cost avoidance in the facilities infrastructure. The technical know-how of this program is transferred to the construction industry in supporting Navy construction and maintenance through the inclusion of individual firms (using competitive selection processes) and industry organizations/associations in the development and testing activities.
.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**	PROGRAM ELEMENT NAME AND NUMBER **Facilities Improvement / PE0603725N**	PROJECT NAME AND NUMBER Navy Facilities System/Y0995

D. (U) SCHEDULE PROFILE:

FY00	**FY01**	**FY02**
High Performance (HP) Magazine Complete all documentation for DDESB approval of siting criteria. Complete all documentation for DOD C3I approval of security system.		
Waterfront Facilities Repair and Upgrade Initiate repair & strengthening of SUBASE Bangor Marginal Wharf using composite materials. Complete pier and wharf capability upgrades using composites materials.	Complete performance validation tests at SUBASE Bangor Marginal Wharf. Develop implementation package for pier repair and strengthening systems. Initiate validation tests of Swinging Weight Deflectometer (SWD) to determine pier lateral load capacity.	Complete validation of SWD.
Real Property Maintenance (RPM) Backlog Reduction Continue testing MCU coatings, hangar floor coatings, F/A-18 resistant pavement, roofing management system. Initiate testing of fly-ash concrete,composites appurtenances, airfield pavement void detection system, auto PCI system. Determine fleet and NAVFAC requirements for FY01 technologies.	Complete validation testing of Roofing Management System, Hangar Floor Coatings, MCU coatings. Develop criteria, standards, and specifications for competitive procurement of these techs to accelerate use in RPM reduction. Continue performance tests of Airfield Void Detection System, composites, fly-ash concrete, and airfield auto PCI . Begin tech selection and reprioritization for 2002. Initiate validation tests of FY01.	Initiate large scale field tests of technologies reprioritized in FY01. Complete Airfield Void Deteection System, fly-ash concrete, concrete appurtenances, and auto PCI tests. Develop criteria standards, and specs for procurement. Begin tech selection and Develop criteria, standards, and planning for FY03.
Modular Hybrid Pier		Initiate conceptual design of modules and major assemblies.

Exhibit R-3 Cost Analysis (page 1)									DATE: **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, BA4**			PROGRAM ELEMENT **Facilities Improvement / PE0603725N**				PROJECT NAME AND NUMBER Navy Facilities System/Y0995					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY00 Cost	FY00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
High Performance (HP) Magazine	WX	NFESC Pt. Hueneme, CA	3.906	0.181	10/99							
	WR	NSWC Indian Head, MD	0.045									
	WR	LANTDIV Norfolk, VA	0.337	0.012	06/00							
	WR	Navy PHS&T Earle, NJ	0.070									
	FP	Ricarl Design Camarillo, CA	0.012	0.007	06/00							
	FP	SVERDRUP St. Louis, MO	0.261									
	FP	Security Dsgn Sci Ventura, CA	0.003									
Waterfront Facilities Repair and Upgrade	WX	NFESC Pt. Hueneme, CA	1.228	0.598	10/99	0.621	10/00	0.251	10/01			
	WR	NUWC New London, CT	0.687									
	FP	Contractors TBD Locations TBD		0.331	08/00	0.050	03/01	0.051	03/02			
Real Property Maintenance (RPM) Backlog Reduction	WX	NFESC Pt. Hueneme, CA	0.704	0.618	10/99	0.792	10/00	0.651	10/01	cont.	cont.	na
	FP	CERF,Wash, DC	0.045									
	RC	LANTDIV Norfolk, VA	0.027									
	FP	N. State Univ. Aberdeen, SD	0.023									
	WR	PWD,NWS Charleston,SC	0.081									
	MIPR	Tyndall AFB Panama City,FL		0.005	02/00							
	FP	Contractors TBD Locations TBD		0.175	09/00	0.344	03/01	0.278	03/02	cont.	cont.	na
Modular Hybrid Pier	WX	NFESC Pt. Hueneme, CA						0.286	10/01	cont.	cont.	na
	FP	Contractors TBD Locations TBD						0.211	06/02			
Subtotal Product Development			7.429	1.927		1.807		1.728				

Remarks:

Total Prior Years Cost: Summation starts with FY94. Subtotal does not include performing activities from prior years that are no longer performing activities.

Exhibit R-3 Cost Analysis (page 2)									DATE: **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N**			PROGRAM ELEMENT **Facilities Improvement / PE0603725N**				PROJECT NAME AND NUMBER Navy Facilities System/Y0995					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Subtotal T&E			0.000	0.000		0.000		0.000		0.000		
Remarks: Included in Product Development costs.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Not applicable.												
Total Cost			7.429	1.927		1.807		1.728			Cont.	Cont.
Remarks:												