



**RESEARCH SUPPORT BUILDING AND INFRASTRUCTURE  
MODERNIZATION PROJECT**

**ACQUISITION STRATEGY**

**OFFICE OF SAFETY, SECURITY, AND INFRASTRUCTURE  
OFFICE OF SCIENCE**

**DEPARTMENT OF ENERGY  
SLAC SITE OFFICE**



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2575 Sand Hill Road

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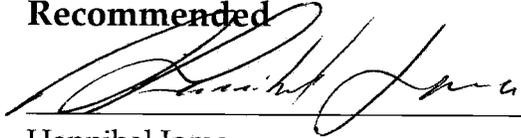
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# Signature Pages

## Recommended



12/03/2008

Hannibal Joma  
Federal Project Director  
DOE

Date



12/03/08

Tyndal L. Lindler  
Contracting Officer  
DOE

Date



12/03/08

Paul M. Golan  
Manager  
DOE

Date

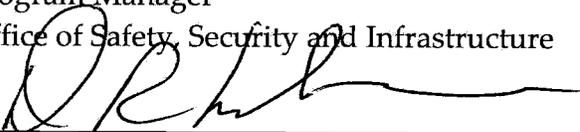
## Concurrence



12/8/08

Stephanie Short  
Program Manager  
Office of Safety, Security and Infrastructure

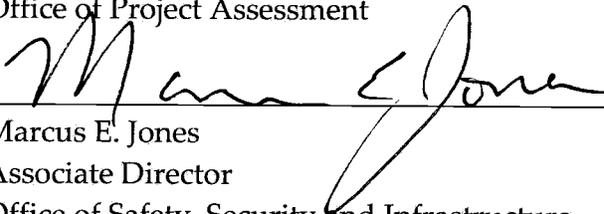
Date



12/12/08

Daniel Lehman  
Director  
Office of Project Assessment

Date



12/18/2008

Marcus E. Jones  
Associate Director  
Office of Safety, Security and Infrastructure

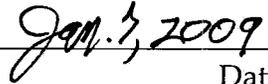
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SIGNATURE PAGES

**Approved:**

  
Raymond L. Orbach

Under Secretary for Science

  
Date

## List of Acronyms

A/E	Architect/Engineer
AIP	Accelerator Improvement Program
ANSI	American National Standards Institute
APP	Advanced Procurement Plan
ASHRA	American Society of Heating, Refrigeration and Air Conditioning Engineers
BLCC	Building Life Cycle Cost
CD	Critical Decision
CDR	Conceptual Design Report
CFR	Code of Federal Regulations
CM	Construction Manager
CSI	Construction Specifications Institute
CX	Categorical Exclusion
DOE	Department of Energy
EMS	Environmental Management System
EOI	Expression of Interest
ES&H	Environment, Safety and Health
EVMS	Earned Value Management System
FPD	Federal Project Director
FY	Fiscal Year
GC	General Contractor
HVAC	Heating, Ventilation, and Air Conditioning
IPT	Integrated Project Team
ISEMS	Integrated Safety Environmental Management System
LCC	Life Cycle Costs
LCLS	Linear Coherent Light Source
LCO	LEED® Certification Official
LEED®	Leadership in Energy and Environmental Design
M	Million
M&O	Management and Operations
NEPA	National Environmental Policy Act
OPC	Other Project Costs
OSHA	Occupational Safety and Health Administration
PED	Project Engineering and Design
PEP	Project Execution Plan
PMCS	Project Management & Control System

## LIST OF ACRONYMS

PPEP	Preliminary Project Execution Plan
Q	Quarter (DOE Fiscal Year)
R&D	Research and Development
RSB	Research Support Building
RSB&IM	Research Support Building and Infrastructure Modernization
SC	Office of Science
Sf	Square Feet
SLAC	SLAC National Accelerator Laboratory
SSO	SLAC Site Office
TBD	To Be Decided
TEC	Total Estimated Cost
TPC	Total Project Cost
USGBC	U.S. Green Building Council

## 1.0 RSB Acquisition Strategy

**Project Title:** Research Support Building and Infrastructure Modernization Project

**Lead Program and Project Office:** Science Laboratories Infrastructure, Office of Science

**Total Estimated Cost Range (TEC):** \$80.0 Million (M) - \$96.0 M

**Total Project Cost Range (TPC):** \$81.0 Million (M) - \$97.4 M

**Critical Decision (CD)-0 Mission Need Approval:** CD-0 for this project was approved by Under Secretary Orbach on October 10, 2008. This document reflects an acquisition strategy to satisfy the identified mission need.

## 2.0 Desired Outcome and Requirements Definition

This section defines the scope and details of the Research Support Building and Infrastructure Modernization Project requirements.

### 2.1 Project Description, Objective, and Scope

SLAC National Accelerator Laboratory (SLAC) proposes the construction of a new energy efficient and environmentally sustainable research support building, the renovation of existing space and the demolition of substandard buildings at SLAC to provide progressive space for furthering the scientific programs at SLAC. The design will use efficient space planning benchmarks as the basis for determining the size and configuration of space types. The design of the new facility will also emphasize open, collaborative environments, with flexibility to respond to future mission changes. The facilities will include office spaces for researchers, small group collaboration spaces, equipment areas, restrooms, circulation space, and supporting infrastructure. These facilities will permit co-location of accelerator scientists and engineers which will promote efficiency and enhanced synergy amongst collaborators. Likewise, the renovations to the existing buildings will group like functions together, improve work spaces and provide an efficient and reliable working environment.

The objective of the proposed Research Support Building and Infrastructure Modernization project (i.e., the RSB Project) is to provide sufficient space in one new building to allow the collocation of SLAC accelerator science staff, and to renovate three existing structures to ensure they are suitable for lab-wide support groups with shared interests and mission objectives.

The scope of the project includes design, construction, and start-up of the new facility, demolition of 13 trailers that occupy the future site of the new building and renovation of existing spaces in buildings 003, 024, and 041.

### 2.2 Mission Need

SLAC is an Office of Science (SC) Laboratory that supports a large national and international community of scientific users performing cutting edge research in support of the Department of Energy mission. Success of that mission is directly coupled to the general purpose infrastructure necessary to conduct this research. At SLAC, accomplishment of that mission is currently at-risk given substandard

buildings that do not provide the appropriate environment to conduct world class science or mission support functions.

SLAC has moved from a single program to a multi-program Laboratory; this transition, combined with the condition and age of SLAC facilities, drives the need to consolidate core research functions and modernize key support buildings. The most pressing infrastructure gaps are the lack of appropriate space to house and co-locate accelerator scientists and key mission support staff who are currently spread across the Laboratory in outdated and inefficient facilities.

To correct these deficiencies, a new building is proposed, to house the Laboratory's accelerator scientists. This new building will replace numerous 40 year old trailers that currently support the Laboratory's accelerator scientists. This will enable integration of the accelerator science and technology community across programmatic boundaries, allowing these scientists to better support the science missions at the Laboratory. In addition, renovation of three buildings is proposed (i.e., 003, 024, and 041). These buildings house key mission support functions, and were part of the original construction of the Laboratory in the mid 1960s. Although the basic core and shell construction are sound, their interior spaces and utility system are obsolete. Overall, the proposed project will upgrade working conditions for over 20% of the Laboratory staff in a way that supports the Laboratory vision of a unified culture with a strong sense of community between all scientific and support functions across the Laboratory.

In summary, SLAC currently lacks appropriate space to house accelerator scientists that today are spread across the Laboratory in outdated facilities, and mission support staff suffers from the inefficiency of multiple outdated facilities. These capability gaps need to be addressed in order to:

- Provide staff with safe, modern, fully compliant spaces that support cutting edge 21st-century science.
- Provide general purpose research and institutional structures to allow the collocation of related groups with shared interests and mission objectives.
- Collocate accelerator scientists to enable interaction among researchers and graduate students who have complementary interests that will support the accelerator based research programs at the Laboratory and optimize cross-program collaboration.
- Strengthen ties and interactions between related areas of research and support functions.

## **2.3 Performance Parameters Required to Obtain Desired Outcome**

The desired outcome will be obtained when construction of new space, renovation of three existing buildings, and the demolition of excess facilities outlined under Project Description, Objective, and Scope above are completed in accordance with the contract drawings and specifications, safety requirements and within the approved schedule and cost baseline. According to current estimates, new construction is anticipated to be in the range of 53,000 – 58,000 square feet; approximately 61,000 square feet of existing space will undergo renovation, and demolition of approximately 20,000 square feet will be completed to provide the site for the new construction.

### 3.0 Cost and Schedule Range

This section presents a breakdown of the preliminary funding, key milestones, and estimated schedule of the project.

#### 3.1 Total Project Cost (TPC) Range

The current Total Estimated Cost (TEC) range is \$80.0 to \$96.0 million, with other project costs estimated at \$1.4 million. Table 1 shows the Total Project Cost Range (TPC) range of \$81.0 – \$97.4 million. This estimate includes design; building construction; environment, safety, and health (ES&H); quality; safeguards and security; construction and project management; contract administration; commissioning and building start-up; and contingency.

**Table 1: Total Project Cost**

Task	Estimate (\$M)
Other Project Costs (OPC) <sup>1</sup>	\$1.4
Project Engineering and Design (PED)	\$8.9
Construction (including renovation and demolition)	\$87.1
<b>TPC</b>	<b>\$97.4<sup>2</sup></b>

Consistent with DOE Order 413.3A, the TPC will be refined with each critical decision (CD) as design and value engineering are conducted and provide additional information. The Performance Baseline will be established at CD-2.

---

<sup>1</sup>Other Project Costs are funded via Laboratory overhead.

<sup>2</sup>The Total Project Cost estimate for this project will be revised as design matures. The value shown is the ceiling.

### 3.2 Funding Profile

Table 2 shows the preliminary funding profile, rounded to millions of dollars, based on the high end of the TPC range.

**Table 2: Preliminary Funding Profile (\$M)**

	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total
PED		\$9						\$9
Construction			\$33	\$20	\$22	\$12		\$87
Total TEC		\$9	\$33	\$20	\$22	\$12		\$96
							OPC	\$1
							<b>Total TPC</b>	<b>\$97</b>

### 3.3 Key Milestones and Events

Table 3 shows the preliminary key milestones planned for this project. The schedule shown assumes funding is available at the beginning of the second quarter of each fiscal year. The schedule contingency is about one (1) month/year of construction. The project schedule will be refined during preliminary design, and final milestones will be established at CD-2.

**Table 3: Key Milestones**

Critical Decision Point	Completion
CD-0, Approval Mission Need	October 10, 2008
CD-1, Approve Alternative Selection and Cost Range	4Q FY 2009
CD-2, Approve Performance Baseline	4Q FY 2010
CD-3, Approve Start of Construction	2Q FY 2011
CD-4, Approve Start of Operations	3Q FY 2015

## 4.0 Major Applicable Conditions

This section presents details on applicable conditions of the project.

### 4.1 Environmental and Regulatory Compliance

The project will comply with all requirements of the National Environmental Policy Act (NEPA) and its implementing regulations (10 CFR 1021 and 40 CFR 1500–1508). A NEPA determination was prepared and a categorical exclusion (CX) is anticipated to be granted for this project in 2Q FY 2009. All environmental issues identified will be responsibly and economically addressed. No amendments are expected to the existing site air permit.

### 4.2 Pollution Prevention Plans

Pollution prevention is an essential element of the SLAC ES&H program. Opportunities for pollution prevention, waste minimization, and resource conservation will be identified and incorporated into the design and construction process.

Oversight of construction activities will be conducted by SLAC to ensure subcontractors are in compliance with these requirements. Materials that can be recycled will not be disposed of in landfills, and new materials used will be specified to contain the maximum amounts of recycled content as practical. Based on previous projects conducted at SLAC, the Laboratory has an excellent record of exceeding the goals on its construction waste management programs.

### 4.3 Safeguards and Security

Security needs of this project are adequately covered by the existing site security as detailed in the SLAC Site Security Plan. The project scope has been coordinated with the Site Security Office, and there are no technical security issues or Laboratory safeguards required to be incorporated into the design or construction activities, or changes in operations. The facility is proposed to be a low-hazard, non-nuclear facility. Access to and from the job site for design or construction activities will be controlled by SLAC's security forces. The SLAC Contractor/Vendor Training and Badging System, which includes minimum training requirements and a contractor database to monitor contractor egress and debarment status, will be used to badge and control access. None of the work on the RSB project is deemed classified. In the event of a site-wide

heightened level in security, the project could be negatively impacted, but will rely on the SLAC Site Security Plan to meet the project objectives. To ensure safeguard and security compliance is met, DOE G 413.3-3, dated 11-15-07 will be the guiding principal for the project. Security representatives from the Site Office and SLAC will be part of the Integrated Project Team.

## **4.4 Technology Research and Development**

There are no technology or research and development efforts associated with the design and construction of the RSB Project.

## **4.5 Sustainable Design**

Decisions regarding the planning, acquisition, siting, design, building, operation, and maintenance of these proposed facilities will be based on the DOE Guiding Principles of High Performance and Sustainable Buildings. New equipment and systems will be selected to maximize energy efficiencies and “green” building technologies. Integration of green purchasing for construction materials will be incorporated into the construction contract by following the Federal Green Construction Guide.

As required by DOE Order 430.2B, the new construction and the major renovations of buildings 024 and 041 will achieve Leadership in Energy and Environmental Design (LEED®) “Gold” Certification. The project team intends to meet the 30% better than American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) requirement during the design process. The renovation of building 003 is not considered a major renovation; therefore, this scope will adhere to the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding.

## **4.6 Environment, Safety and Health**

ES&H issues during demolition, renovation, and construction are typical of standard industrial building construction. Inspection and testing of suspect material will be performed prior to demolition. Decontamination, demolition, and disposal of building and materials will be done in an environmentally conscientious and safe manner.

The proposed project will be performed under the SLAC Integrated Safety and Environmental Management System (ISEMS) encompassing the Federal Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations 1926, Subpart C, to ensure protection of workers, the public, and the

environment. ISEMS will be implemented into management and work process planning at all levels. 10 CFR 851 will also be required to ensure work is performed in a manner that protects the safety and health of workers.

Asbestos is known to exist in the areas to be demolished and renovated. No specific areas of other environmental contamination have been identified in the scope of this project. Because the potential exists for finding contamination, SLAC will monitor for contamination during site preparation, excavation, and demolition activities for the RSB project.

## 4.7 Funding

The scope of this project is limited to the design and construction of the RSB building, the demolition of all trailers within the RSB footprint approximately 20,000 gross square feet, and renovation of buildings 003, 024, and 041. The total gross square feet of trailer space to be demolished to meet the requirement of one-for-one replacement will be outlined in the PEP. The project is funding the demolition of the 20,000 gross square feet of trailers in the future site of the RSB building. The project has a preliminary TPC range of \$81.0 – \$97.4 million. The major elements of the TPC based on initial parametric cost estimates are approximately \$9 million for design and project management and approximately \$77 million - \$87 million for construction and demolition including an average of 25% contingency. The funding range is supported by a project estimate that includes contingency.

The preliminary estimate is a parametric estimate prepared by SLAC engineers using recently bid or completed projects for reference. The construction estimate is based on the measurement and pricing of quantities wherever information is available and parametric costs using reasonable assumptions. The unit rates have been obtained from historical records and discussions with contractors and other national laboratories. The actual project cost is expected to be within the range.

## 5.0 Risks and Alternatives

This sections details the known risks and alternative solutions of the project.

### 5.1 Risk Management

A preliminary risk management plan will be drafted to address risks for the entire scope of the project. The plan addresses the internal and external influences that could present risk to and affect the performance of the project. Preliminary risk analysis processes, conclusions, and strategies will be fully developed during preparation of the Conceptual Design Report. The currently identified risks are as follows:

1. Construction prices are higher than the estimated cost due to escalation of labor and material prices in recent construction market conditions.

#### **Mitigation Measures:**

- Commission an independent cost estimate during the final stages of design from a firm in the local area that is most familiar with the market. This independent cost estimate will improve the baseline estimate, and evaluate any changes in labor rates or union agreements that may impact the estimate ensuring the most current material and escalation costs for the area are included in the estimate.
- Include a design-to-cost clause with the intent of FAR 52.236-22, Design Within Funding Limitations in the design contract, and SLAC will be vigilant to enforce it.
- Use a Construction Manager (CM) during the design process as described in Section 5.0. The CM will perform constructability and value engineering reviews and will be tasked to generate a construction cost estimate for further validation of the total construction costs. Cost disparity will be realized early and actions will be taken to revise the design as necessary prior to solicitation.
- Reevaluate and update the escalation rates as the conceptual design progresses. Escalation rates used for the RSB project of 4% are based on DOE Office of Cost Analysis, CF-70, draft Annual Escalation Indexes for DOE General Building Construction from FY 2010 to FY 2018.

- Identify positive and negative alternatives in the construction specification to allow cost flexibility at award of the construction contract.

2. Limited competition results in higher than expected costs.

**Mitigation Measures:**

- Conduct active marketing to inform potential contractors of this future opportunity.
- Complete market research and notice of opportunity and site visits.

3. Continuing Resolutions cause schedule delays.

**Mitigation Measures:**

- Create contingencies in project schedule to manage funding change. The project schedule is based on the assumption that funding will be received at the beginning of the second quarter of each fiscal year.

4. Excessive project scope changes, including changes due to past errors and omissions, have the potential to result in increased cost and schedule duration.

**Mitigation Measures:**

- Address all changes to baseline in accordance with project Baseline Change Control Procedures. These procedures will be detailed in the PEP and in accordance with SC guidance.
- Closely coordinate efforts with Laboratory directorates (i.e., the Users) to ensure specific requirements and needs are identified and addressed early-on.
- Utilize established quality assurance and design review processes to reduce potential errors and omissions.
- Require the project team to monitor and trend all variations against the Performance Measurement Baseline and quantify any cost and schedule impacts.
- Use a Project Baseline Change Control Board to review and disposition proposed baseline changes.
- Require the project team to monitor contractor performance to ensure safe work practices are followed.

- Ensure all work and material being installed is inspected for compliance with contract documents.
5. Unknown environmental contamination is encountered during site preparation and construction.

**Mitigation Measures:**

- Review historical information and perform environmental sampling during initial site assessment. Monitoring will be performed during site preparation and excavation for environmental contamination.
6. The removal of the existing control racks and equipment in Building 003 has the potential to impact the scheduled start of demolition and construction of building 003 renovations. This scope of work is funded by the Accelerator Improvement Project and is outside of RSB project scope.

**Mitigation Measures:**

- Prioritize Accelerator Improvement Project funds to remove control racks and equipment as soon as funds become available. The planned removal date for the racks and equipment is in advance of the relocation and beneficial occupancy and should not cause delays to the project.

Risk identification and analyses will be continued throughout the planning and execution processes. Each of the above identified risks will be monitored to ensure they have been satisfactorily addressed, eliminated, or managed.

## 5.2 Technical Alternatives Analysis

The following project alternatives were analyzed to ensure the proposed strategy is the most cost-effective method of meeting the identified mission goals. The advantages and disadvantages for each of these five alternatives were considered and are described below.

Alternative A: Maintaining the status quo (no action). SLAC will continue to operate the current facilities.

Alternative B: Improving existing structures. No new construction; instead existing facilities will be renovated to eliminate deferred maintenance and address compliance issues.

Alternative C: Decommissioning and demolishing current facilities and building new facilities to replace them. Under this alternative, all of the facilities currently housing these staff will be demolished and replaced with new construction.

Alternative D: Replacing and renovating current facilities. This alternative will renovate existing facilities that are structurally and functionally sound, and will replace those facilities that are not functionally sound with new space.

Alternative E: Performing the work at another location; for example, another Laboratory or a university.

**Alternative A – Maintaining the status quo (no action).** This is not a viable option due to the high costs of maintaining the existing 40+-year old buildings, the increasing number of interruptions from environmental conditions such as temperature fluctuations and dust and dirt in the air supply, the pressing need to provide a safer environment for current staff, and the need to ensure SLAC's ability to respond to critical missions in service to the Nation. As discussed in the Mission Need Statement, this alternative does not address the infrastructure gaps to reduce the deferred maintenance backlog; reduce preventive maintenance costs; increase system reliability, and improve space and energy efficiency, thus making more funds available to support science. This alternative also lacks appropriate space to consolidate accelerator scientists and key Laboratory support functions that are currently spread across the Laboratory in outdated and inefficient facilities. It continues to house people working on the same research in widely separated areas. Therefore, this alternative is not recommended.

**Alternative B – Improving existing structures.** Under this alternative, no new construction will begin; instead, existing facilities will be renovated to eliminate deferred maintenance and address compliance issues. Existing space will be adapted to provide updated space for research under this alternative. While this alternative will provide more reliable facilities, less outages from systems failures, and reduced energy costs over Alternative A, it is not a viable alternative because it does not support the capability gap to collocate accelerator scientists and is therefore not the recommended alternative.

**Alternative C – Decommissioning and demolishing current facilities and building new facilities.** Under this alternative, all of the facilities currently housing SLAC staff will be demolished and replaced with new construction.

Replacing the existing structures with new structures addresses the capability gap and allows the organization of people into common work areas; however, the increased construction cost and the life cycle cost is why this alternative is not recommended.

**Alternative D – Replacing and renovating current facilities.** This alternative will renovate existing facilities that are structurally and functionally sound, and will replace those facilities that are not with new space. This option will remove the multiple inadequate structures and build one new structure allowing staff working on one or correlated projects to be adjacent to each other. Existing buildings with sound infrastructure will be renovated to match the program needs and reduce energy consumption. This alternative meets the capability gap of collocating accelerator research staff and reduces the cost of doing business, and therefore is the recommended choice.

**Alternative E – Performing the work at another location.** This option is to provide capability for the research programs at other laboratories or universities, eliminating the need to provide space for this work at SLAC. This alternative was dismissed from further evaluation for a number of reasons:

- The existing facilities are used by approximately 275 principal investigators and associated staff. They benefit from being associated with other core research programs at SLAC, and relocating this work to another laboratory would diminish SLAC's effectiveness. Collocation of this research at SLAC is more effective because of the increasing interdisciplinary collaborative nature of today's research activities.
- SLAC has in place large, complex, and one-of-a-kind tools that are not generally available anywhere else in the world. Access to such tools has created an accommodating infrastructure to support the user population for this unique combination of research efforts.
- Relocation of the staff to another laboratory or university would be difficult, disruptive, and expensive. It is not feasible to relocate the primary infrastructure supporting science at SLAC.

Based on the factors described above, the most cost-effective and timely approach for DOE to meet the mission need is alternative D, replacing and renovating by constructing a new research support building, renovating appropriate existing buildings and demolishing a large number of small inadequate structures.

### 5.3 Economic Analysis

An economic analysis was completed by SLAC project team members to evaluate the life cycle costs (LCC) of alternatives A, C, and D as described above. The categories of cash flow data required for evaluation of the life cycle cost for each alternative consist of: capital investment costs, energy and utility consumption costs, general maintenance costs and major equipment repair and replacement costs (sustainability), deferred maintenance costs, compliance modification costs, and cost associated with productivity loss. Building Life-Cycle Cost (BLCC) software (specifically BLCC5) from the National Institute for Standards and Technology was used as a model for the life cycle cost analysis. A summary of the analysis is presented in Table 4. In this table, the present value of life cycle costs is shown as evaluated over a 50-year period.

**Table 4: Summary of Life Cycle Cost Analysis**

ALTERNATIVE	DESCRIPTION	LCC	BENEFITS
A	Maintain the status quo – Continue to operate under current conditions and procedures.	\$179,439k	No personnel moves and thus no disruption to ongoing research.
C	Replace the existing facilities with new facilities including combining the trailer spaces into one facility.	\$185,608k	Provides efficient space to combine work groups.
D	Construct a new facility, renovate selected buildings and demolish substandard structures	\$161,774k	Will result in new modern energy efficient space for accelerator R&D and associated support functions. Most cost effective alternative.

The analysis indicated alternative D yields significant economic benefits. The initial capital investment for this facility will result in significant cost savings over a 50-year period, assuming a base date of September 2009. The simple payback is expected to be 5.5 years.

## 6.0 Business and Acquisition Approach

### 6.1 Acquisition and Subcontract Types

SLAC will have the primary responsibility for oversight of design and construction subcontracts, LEED®, commissioning, and estimating services necessary to execute this project scope. SLAC has extensive experience in the management and oversight of contracts of equal or greater complexity than the proposed RSB project. SLAC's project management, construction management, and ES&H management systems have all proven to be effective in the execution and control of projects of similar scale and magnitude. Accordingly, with the forecasted completion of the conventional facilities portion of the Linac Coherent Light Source (LCLS) project in late FY 2008/early FY 2009, experienced personnel will be drawn upon to support this project.

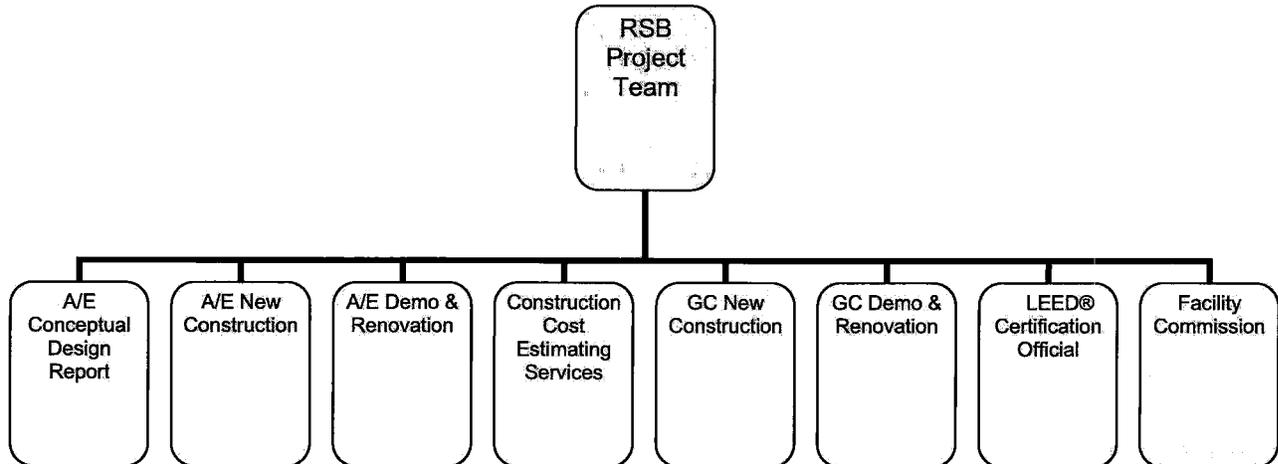
Various acquisition alternatives were considered for this project such as traditional design-bid-build, design/build and CM/GC. After considering these alternatives in relation to the schedule, size, and risk, the use of traditional Design-Bid-Build approach was selected. The design will be prepared by an A/E firm; preconstruction services will be provided by a Construction Management (CM) firm; and construction will be provided by a General Contractor (GC). All activities will be managed by the RSB Project Team with oversight by the Integrated Project Team. This strategy is deemed to provide the best construction delivery method and the lowest risk to the new construction, renovation of existing buildings and demolition of existing trailers.

In evaluating the delivery method, **the traditional Design-Bid-Build** approach provides the Laboratory with maximum amount of control over the scope, schedule and budget. The downside of this approach is the lengthy time to award construction. The **Design/Build** approach is historically utilized when schedule urgency drive the project. In the case of the RSB project, such condition does not exist and construction schedule will include sufficient float to ensure successful completion. The drawback of this approach is the Laboratory does not have as much control over the scope, schedule and budget. Therefore, the **CM/GC** approach was ruled out due to the increased risk of losing control of the project to a firm doing both the construction management and also acting as the general contractor. This approach has inherent management and oversight issues that have caused project oversight issues with other projects on site. Figure 1 below, graphically identifies the acquisition strategy for procurement

for the service on the RSB project.

Figure 1 below, graphically identifies the acquisition strategy for procurement for the service on the RSB Project.

**Figure 1: Acquisition Approach for Services**



In addition, SLAC’s standard procurement practice for construction is to use firm fixed-priced contracts for all procurements, and SLAC has extensive experience in project management, construction management and ES&H management systems in the acquisition of scientific facilities.

The San Francisco Bay Area region has a large number of qualified general contractors capable of constructing this project. It is expected that the value and scope of the project will attract a significant number of qualified bidders, ensuring full and open competition. Active marketing will be conducted to inform potential contractors of this future opportunity. The evaluation criteria will establish requirements for technical competency, cost and schedule, safety performance and overall performance on past projects.

During the design and construction phases, the SLAC Project Manager along with SLAC procurement will develop an advanced procurement plan (APP) to identify potential major procurements (e.g., equipment) that the GC will need to execute that represent significant cost and/or schedule risk.

**Design**

SLAC will oversee design performance by A/E firms. The solicitation for the A/E will be a qualifications-based selection, firm fixed-price subcontract that utilizes the design-to-cost approach. The subcontract will be inclusive of all material,

bonds, equipment, labor, etc. necessary to perform the work. The contract specifications will describe required quality and performance parameters.

The A/E firms selected will be experienced in the design-to-cost approach and application of the U.S. Green Building Rating System (i.e., LEED®) in their designs. The design effort will include scope-reduction provisions to absorb reduced budget authority equivalent to approximately 10%. The designs will incorporate sustainable design features, industry space standards, and meet applicable Building, Life, and Safety Codes. The project anticipates completing design services in two phased approach:

Conceptual Design – The project anticipates hiring a firm to provide A&E services to complete a Conceptual Design Report (CDR). This A/E firm will not be eligible to compete for the final design contracts. The CDR will provide the detailed design criteria and functional requirements for demolition of 13 trailers that occupy the future site of the Research Support Building, new construction of the Research Support Building and renovation of existing spaces in buildings 003, 024 and 041. The CDR is a part of the CD-1 package.

Final Design - The project anticipates hiring two firms that provide A&E services to complete the final design. One A/E firm will be hired to complete final design for the demolition of 13 trailers that occupy the future site of the new building and renovation of existing spaces in buildings 003, 024 and 041. The second A/E firm will be hired to complete final design for the new construction of the RSB. Each firm will be responsible for delivery of technical specifications and plans, and construction support for shop drawing reviews; the A/E firms will also develop preliminary cost estimates, and provide support during the construction phase of the project for their specific scope.

This approach will require additional coordination by the SLAC project team, but, separating the new construction from the demolition/renovation design, provides additional assurances that the firms selected can focus on discrete scopes of work and ensure adequate resources are available to complete the final designs within the milestones outlined herein.

### **Construction Management**

SLAC will directly oversee performance of the Construction Manager. During design, SLAC will issue a solicitation for preconstruction and construction management services. This solicitation will also be a qualifications-based selection, firm fixed- price subcontract. The pre-construction services will

include budgeting, scheduling, cost estimating, constructability reviews, value engineering studies, and dispute avoidance.

The A/E will be required to coordinate with the CM during the detailed design phase to ensure the design is within the construction value. Value engineering will be an ongoing process and completed with the design package by SLAC's engineers and architects, in partnership with the A/E and CM. Additional peer reviews will be requested throughout the project life. It is anticipated that one CM will handle all construction work. The CM cost estimator will be required to work with the A/E in reconciling any cost differences to the satisfaction of the SLAC RSB Project Manager and document the results.

### **Facility Construction and Renovation**

Facility construction and renovation will be based on the detailed design specifications developed by the A/E. The general construction requirements will be evaluated procurements resulting in firm fixed-price subcontracts. Qualified firms must meet specific criteria established by SLAC for performing construction activities. Criteria for safety will include a Health and Safety Program that satisfies plan elements defined by OSHA and 10 CFR Part 851. SLAC will conduct mandatory pre-proposal meetings to validate compliance with the project scope and safety and health requirements. It is expected that pre-proposal meetings (which will include the CM) will ensure that the design specifications and drawings will include sufficient detail to allow prospective contractors to formulate firm fixed-price offers without excessive contingency and allowances.

SLAC is committed to conduct work in accordance with the highest regard for safety for the workers and the environment. Each general contractor (GC) will be required to submit a written company Health and Safety Plan and a Site Specific Safety Plan (SSSP) in compliance with SLAC ES&H and project requirements for review and approval. This safety plan will meet or exceed all applicable project safety requirements and must comprehensively address all anticipated hazards for executing the construction and identify the appropriate protective measures that will be used to mitigate the hazards. All subcontractors must follow the requirements in these plans. Construction will utilize proven conventional methods. SLAC will oversee the construction performed by the GC. The GC is responsible for all construction related to this project.

The project anticipates completing construction using multiple qualified general contractors (GC):

New Construction - The project anticipates utilizing one GC for the new Research Support Building

Renovation and Demolition – The project anticipates utilizing separate GC(s) for the renovation of building 003, building 024, and building 041. These GC(s) will also be responsible for the demolition of existing structures on the site of the Research Support Building.

Separate GCs are desirable as these projects are not physically connected and are planned to be time phased to allow accommodation of staff currently occupying the areas being either demolished or renovated.

### **LEED® Certification**

The IPT will oversee the requirements for LEED® Certification on project work. The LEED® Certification Official (LCO) will identify and integrate viable sustainable design strategies into the new construction and renovation of existing buildings. This will include investigating, organizing and managing LEED® criteria for technical and cost viability, establishment of LEED® “Gold” Certification criteria within project scope and budget for the conceptual design.

During the final design phase, the LCO will work with the project team to develop the associated LEED® documentation, oversee incorporation of LEED® criteria into plans and specifications and update LEED® “Gold” Certification scorecard per design documents.

During the construction/occupancy phase the LCO will review plans and specifications to ensure LEED® compliance, oversee LEED® credit implementation on the job site, prepare LEED® “Gold” Certification documents for submittal, submit LEED® Certification application, respond to U.S. Green Building Council (USGBC) review queries and comments and lastly conduct LEED®-related commissioning, and measurement and verification services.

An LCO will register the project and follow through to commissioning and certification and will be an integral part of the management team. SLAC is currently developing the in-house capability; however, if SLAC is unable to obtain this capability, the project will obtain an LCO as a consultant directly to SLAC or preferably from the A/E firm during the CDR preparation phase.

### **Facility Commissioning**

SLAC will oversee the commissioning agent. The commissioning agent will be required to provide the documented confirmation that building systems function according to criteria set forth in the project documents to satisfy SLAC’s

operational needs. Commissioning systems in the existing structures may require developing different functional criteria to address the current requirements for system performance. SLAC will hold the commissioning agent responsible and will not accept any construction until SLAC maintenance and operations approves the installation in writing, receives maintenance and operational training, and receives all required documents.

### **Independent Construction Cost Estimating Services**

Lessons learned from previous similar DOE construction projects that apply to this effort include utilizing a regional contractor to provide ‘independent’ bottoms up, bid quality estimate at 100% design to compare against the project’s own estimate. The estimate shall include a breakdown of self-performed and subcontractor-performed work with appropriate mark-ups. The construction cost estimator shall have experience in construction estimating and government construction cost estimates. An understanding and working knowledge and delivery of the CSI Division format are necessary, including labor and material estimating, understanding open shop, prevailing wage or union pricing.

Subsequent reconciliation of the differences between the project’s own estimate and the independent estimate will significantly reduce the risk of construction bids being much higher than the project’s estimate.

## **6.2 Competition and Source Selection Procedure**

It is anticipated that for all solicitations, consideration will be given to small and large business firms. Awards to a large business above \$550,000 (\$1,000,000 for construction), SLAC is required to develop a Small Business Subcontracting Plan. The plan must include goals for the utilization of small business, veteran-owned small business, service-disabled veteran-owned business concerns, Historically Underutilized Business Zone small business, small disadvantaged business and women-owned small business concerns as subcontractors.

Each procurement action will be performed in a competitive environment based on the best value continuum approach. The major efforts will involve the evaluation of the CM and GC safety performance based on the industry “Mod Rate”<sup>3</sup>, and the technical criteria in accordance with the guidelines stipulated in

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<sup>3</sup> Mod Rate is an industry measure of safety performance. The rate indicates the injury rate based on 200,000 hours (100 man years) of effort.

DEAR 936.602. The technical criteria include qualifications, past performance, experience, capabilities, personnel qualifications, resource availability to meet the schedule requirements and cost considerations. Contract award will be made to those Contractors who deem to offer the best value to the project. All contract awards will be processed in accordance with DOE and SLAC approved procurement processes.

### **6.3 Risks**

Given the acquisition approach outlined in Section 5, the only acquisition risk that is considered significant at this time is the risk of increased costs due to escalation of labor and material prices in past turbulent construction market conditions. Appropriate contingency is included in the project estimate to address this risk. All other known risks in the procurement process are those inherent to all procurements, such as the need to allot sufficient time to develop the solicitation and subcontract documents, to review the offers received and develop recommendations for award, to receive the appropriate reviews and approvals during both the solicitation and subcontract award phases for each. These risks will be monitored and managed during the procurement processes by the Integrated Project Team.

## 7.0 Management Structure and Approach

This section presents details on the management structure and staffing approach for the project.

### 7.1 Integrated Project Team, Organization Structure and Staffing Skills

An integrated project teaming approach is utilized for providing support to the Federal Project Director (FPD) and the SLAC Project Manager on this project. The Integrated Project Team (IPT) is organized and led by the FPD, and consists of members from both DOE and SLAC. All members of the team were involved in the review and approval of the Acquisition Strategy. The FPD will work closely with the DOE program manager in the SC Office of Safety, Security and Infrastructure to assure that the project execution is consistent with program goals and objectives and to ensure the Acquisition Executive and appropriate DOE Headquarters personnel are apprised of the project status. This will be accomplished through routine conference calls, site visits, reviews, and other formal and informal communications.

The IPT membership will change as the project progresses from initiation to closeout to ensure the necessary skills are represented to meet the project's needs. The membership, roles and responsibilities will be defined in an IPT Charter.

The Preliminary Project Execution Plan (PPEP) will be the primary management tool for the FPD in executing the project. Required changes to cost, scope, or schedule, during execution of the project will be controlled according to the thresholds and processes described in the PPEP.

### 7.2 Management, Performance Evaluation, and Validation

The RSB team will employ the Project Management and Control Systems (PMCS) developed for the LCLS project. The PMCS includes cost, schedule and change control (scope).

Surveillance of the RSB project will be done at three basic levels.

First, the FPD will monitor and evaluate the project performance against the technical, cost, and schedule baselines through monthly project reports reviews, quarterly project performance reviews, and in-depth reviews as needed. ES&H and quality assurance performance will also be monitored by conducting periodic field observations, using subject matter experts as necessary.

The FPD will measure and evaluate progress against the project goals and milestones, budgets, and schedule, and give advance warning of trends, deviations, and other problems to facilitate timely corrective actions that will minimize impacts on cost, schedule, and quality. The FPD will conduct regularly scheduled meetings and reviews to discuss project technical scope, schedule, and cost status, and emerging issues. Participants will include the IPT representatives as deemed appropriate.

Second, SLAC has a certified Earned Value Management System that is in compliance with American National Standards Institute-748-A-1998. The system will be used to monitor and evaluate project progress and performance for the duration of the project. Cost and schedule indices will be used as leading indicators for management to make the necessary decisions to correct variances from the plan. A monthly analysis of schedule and cost data will be used to evaluate the current project status and forecast the total estimated project cost and completion date. Scope, cost and schedule changes will be presented to a Change Control Board for approval prior to implementation.

Lastly, the CM and GC will be required to have their own performance monitoring systems in place to evaluate and track progress and ensure compliance with the contractual documents throughout execution of the construction contract.

### **7.3 Interdependencies and Interfaces**

The primary interdependence/interface for this project will be between SLAC and its subcontractors. These will be managed by SLAC through contract terms and conditions that include defining appropriate interface relationships and performance requirements, project delivery expectations, and use of contractor project management systems. There will also be interfaces with the users and occupants of buildings 003, 024, 041 and trailers that are going to be demolished. These occupants will be impacted due to the requirements to relocate staff during the new construction or renovations of existing buildings. However, the project team will attempt to reduce the impacts and disruptions to staff and ongoing research in these facilities.

## MANAGEMENT STRUCTURE AND APPROACH

In advance of remodeling of Building 003, SLAC will remove existing equipment and systems currently supporting Operations. The work will be performed under the Accelerator Improvement Program (AIP).

Associated with the Research Support Building and for compliance with the Federal requirement, SLAC will demolish and remove other temporary structures within the campus. The total one-for-one replacement is planned to exceed the total area of the Research Support Building. The Research Support Building is planned to be constructed in the range of 53,000 – 58,000 gross square feet; approximately 20,000 gross square feet of trailers that currently reside on the site for the RSB building will be demolished with project funding. The remaining balance of gross square feet to be demolished to meet the one-for-one replacement will be funded by the Laboratory.