

Science Laboratories Infrastructure

Overview

The Science Laboratories Infrastructure (SLI) program mission is to support scientific and technological innovation at the Office of Science (SC) laboratories by funding and sustaining mission-ready infrastructure and fostering safe and environmentally responsible operations. The program provides the infrastructure necessary to support world leadership by the SC national laboratories in the area of basic scientific research, now and in the future. The SLI program's primary focus is on long-term modernization of SC laboratory facilities and infrastructure to ensure the mission readiness of SC laboratories by ensuring that laboratories have state-of-the-art facilities and infrastructure that are flexible, reliable, and sustainable in support of scientific discovery. The SLI program also funds Payments in Lieu of Taxes (PILT) to local communities around the Argonne, Brookhaven, and Oak Ridge National Laboratories.

In November 2013, the DOE Secretary chartered^a the National Laboratory Operations Board (LOB) to assess facilities and infrastructure across the national laboratory complex, among other things. These enterprise-wide assessments resulted in a rigorous and consistent analysis of the condition, utilization, and functionality of the facilities and infrastructure that are the most critical to mission accomplishment. Building on these assessments, SC worked with each of its laboratories to develop comprehensive Campus Strategies, integrated into the SC Annual Laboratory Planning process. Each Campus Strategy identifies activities and infrastructure investments (e.g., line-item construction, General Plant Projects [GPPs]) required to achieve the core capabilities and scientific vision for that laboratory. SC leadership used these Campus Strategies to establish the corporate facilities and infrastructure priorities going forward.

Overall, SC invests over \$400 million dollars annually in needed maintenance, repair, and upgrades of general purpose infrastructure. These investments are from a variety of funding sources, including federal appropriations for line-item construction projects and GPPs, as well as overhead-funded investments in institutional GPP work and routine maintenance and repair. The SLI program provides two important pieces of this overall strategy – line-item construction projects and a suite of infrastructure support investments that focus on laboratory core infrastructure and operations. This budget request for SLI reflects the rigor of and output from the broader SC-wide planning activities described above.

Highlights of the FY 2016 Budget Request

Ongoing projects that will provide new laboratory buildings, renovated facilities, and upgraded utilities are proceeding towards on-time completion within budget. While significant improvements to SC infrastructure have been made, it is important to maintain a strong level of investment and continue making improvements across the SC national laboratory complex. This request does so by providing continued funding for the Materials Design Laboratory project at Argonne National Laboratory (ANL), the Photon Science Laboratory Building project at SLAC National Accelerator Laboratory (SLAC), and the Integrative Genomics Building project at Lawrence Berkeley National Laboratory (LBNL).

In addition, this request includes increased funding for the Infrastructure Support subprogram. This increase addresses a basic need in core general purpose infrastructure. The top priorities identified as part of the Campus Strategy discussions include electrical upgrades at SLAC and ANL and facility improvements at Fermi National Accelerator Laboratory (FNAL). The Request also initiates support for nuclear operations at the Oak Ridge National Laboratory (ORNL) that was previously funded by Congressional Direction under The Office of Nuclear Energy.

^a http://fimsinfo.doe.gov/Downloads/Infrastructure_Assessment_Group.pdf

**Science Laboratories Infrastructure
Funding (\$K)**

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015
Infrastructure Support	8,236	8,236	13,590	44,690	+31,100
Construction					
Infrastructure and Operational Improvements at PPPL (15-SC-75)	0	0	25,000	0	-25,000
Materials Design Laboratory at ANL (15-SC-76)	0	0	7,000	23,910	+16,910
Photon Science Laboratory Building at SLAC (15-SC-77)	0	0	10,000	25,000	+15,000
Integrative Genomics Building at LBNL (15-SC-78)	0	0	12,090	20,000	+7,910
Utilities Upgrade at FNAL (13-SC-70)	34,900	34,900	0	0	0
Utility Infrastructure Modernization at TJNAF (13-SC-71)	29,200	29,200	0	0	0
Science and User Support Building at SLAC (12-SC-70)	25,482	25,482	11,920	0	-11,920
Total, Construction	89,582	89,582	66,010	68,910	+2,900
Total, Science Laboratories Infrastructure	97,818	97,818	79,600	113,600	+34,000

**Science Laboratories Infrastructure
Explanation of Major Changes (\$K)**

	FY 2016 vs. FY 2015
Infrastructure Support: This increase in funding addresses a basic need in core infrastructure. The top priorities identified as part of the Campus Strategy discussions include electrical upgrades at SLAC and ANL and facility improvements at FNAL. Nuclear operations at the Oak Ridge National Laboratory (ORNL) has previously been funded by Congressional Direction under The Office of Nuclear Energy.	+31,100
Construction: Continuation of funding for three FY 2015 new start projects. One FY 2015 new project start requested full funding in FY 2015 and does not require continuation of funding in FY 2016.	+2,900
Total, Science Laboratories Infrastructure	+34,000

Program Accomplishments

The SLI program has successfully completed over \$600 million of infrastructure projects since FY 2006, when SC initiated a modernization effort to provide impactful infrastructure investments across the laboratory complex.

The *Renovate Science Laboratories, Phase II project at Brookhaven National Laboratory (BNL)*. Renovation of the primary physics (Building 510) and chemistry (Building 555) laboratory buildings was completed within budget and on schedule. The project achieved CD-4, Approve Project Completion, on June 4, 2014. Beneficial Occupancy of the renovated portions of Building 555 was achieved on November 20, 2013 and Beneficial Occupancy of the renovated portions of Building 510 was achieved on February 28, 2014. The project scope included the design, selective demolition, construction, and start-up testing of building systems for the renovated areas of each building. The completed project significantly upgraded and rehabilitated existing, obsolete, and inadequate physics and chemistry research labs into modern, efficient research environments commensurate with world-class scientific research. The project is on track to earn two Leadership in Energy and Environmental Design (LEED) Silver certifications, one for Building 510 (physics) and one for Building 555 (chemistry).

The *Seismic Life-Safety, Modernization, and Replacement of General Purpose Buildings, Phase II project at Lawrence Berkeley National Laboratory (LBNL)*. Renovation and new construction of this project was completed within budget and ahead of schedule. The renovation of Building 74 was completed on September 25, 2012, with approval of CD-4A/B, Approve Start of Construction for Phase B. Seismic strengthening of Building 85 rectified seismic deficiencies and provided modern general purpose laboratory space used for research in energy and the environment, and was completed in July 2013. The issuance of the Beneficial Occupancy of the General Purpose Laboratory (GPL) building was the document that allowed for the CD-4C awarded on August 5, 2014. This project was completed nearly a year ahead of schedule and under budget while it managed to achieve its threshold key performance parameters. Notably, a LEED Gold certification for the GPL will be awarded, and a LEED Platinum certification for the Building 74 renovation has already been awarded.

The *Research Support Building and Infrastructure Modernization project at SLAC National Accelerator Laboratory (SLAC)*. Construction was completed on the Research Support Building (B052) on May 31, 2013. The project replaced more than twelve 35-year old trailers and achieved LEED Gold certification. CD-3B, Approve Start of Construction, which includes the modernization of Building 41, was approved on June 28, 2013.

The *Energy Sciences Building project at Argonne National Laboratory (ANL)*. Construction of this laboratory was completed within budget and ahead of schedule. Beneficial Occupancy of the new 173,000-square foot main building was achieved on May 21, 2013 and of a laboratory module extension on May 20, 2014. The project achieved CD-4, Approve Project Completion, on August 6, 2014. The building was designed to encourage collaboration among some of the country's leading scientists in chemistry, materials sciences, and condensed matter physics research and will accommodate over 240 research and support staff. This new building established a new consolidated campus for the energy sciences at ANL. The project is on track to earn LEED Gold certification for the new building.

The *Science and User Support Building project at SLAC National Accelerator Laboratory (SLAC)*. Preliminary construction work, including the demolition of an existing cafeteria, commenced in September 2013. The project is progressing ahead of schedule and within budget. Construction of foundations was completed in June 2014 and erection of the steel frame structure began in July 2014.

The *Utilities Infrastructure Modernization project at Thomas Jefferson National Accelerator Laboratory (TJNAF)*. Construction of the first phase began after achieving CD-3A, Approve Start of Construction for Phase A, and concurrently with CD-2, Approve Performance Baseline, on May 21, 2014. Construction of the second phase began upon achieving CD-3B, Approve Start of Construction for Phase B, on June 30, 2014. The project is progressing ahead of schedule and under budget.

**Science Laboratories Infrastructure
Infrastructure Support**

Description

This subprogram funds a suite of infrastructure support investments that focus on laboratory core infrastructure and operations. Investments in core infrastructure (e.g., utility systems, site-wide services, and general-purpose facilities) are an ongoing need that ensures facilities and infrastructure are upgraded when they approach end-of-life, systems are improved to increase reliability and performance, and excess space is removed so that it no longer requires operation and maintenance funding. Without this type of investment, SC laboratories would not be able to keep up with the pace of needed renewals. Activities include General Plant Project upgrades at various laboratories, stewardship-type needs (e.g., roads and grounds maintenance) across the Oak Ridge Reservation, and operations support for the nuclear facilities at Oak Ridge National Laboratory.

This subprogram also funds Payments in Lieu of Taxes (PILT) to local communities around the Argonne, Brookhaven, and Oak Ridge National Laboratories.

Note that this budget request combines the Facilities and Infrastructure activity with the Oak Ridge Landlord activity, which had been broken out separately in prior requests.

Funding (\$K)

	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015
Infrastructure Support					
Facilities and Infrastructure	900	900	6,100	30,977	+24,877
Nuclear Operations	0	0	0	12,000	+12,000
Oak Ridge Landlord	5,951	5,951	5,777	0	-5,777
Payments in Lieu of Taxes	1,385	1,385	1,713	1,713	0
Total, Infrastructure Support	8,236	8,236	13,590	44,690	+31,100

Facilities and Infrastructure

In the FY 2016 Request, the Infrastructure and Support subprogram initiates funding of infrastructure support investments that focus on laboratory core infrastructure and operations. Each SC laboratory conducted a rigorous condition assessment of its core infrastructure over the past year, and those assessments validated the need for investments in these basic systems that form the backbone of our campuses. The SLI program, in close collaboration with leadership in the research programs, reviewed these investment needs and the highest priority activities will be funded by this request. Plans for FY 2016 funding include projects such as replacing nine 12kV -480 V substations (K-subs) serving the SLAC linac (where their performance has proved unreliable) and upgrading approximately 1.5 miles of high voltage electrical cable and associated substation equipment at ANL to a fully redundant 138kV system. The latter system will provide support in the event of an electrical failure to key mission critical facilities at ANL. At FNAL, renovations to Wilson Hall will provide for increased collaboration space on 2 of the 15 floors in the lab's largest building and will correct deficiencies on the building exterior.

The subprogram also supports the following activities:

- General facilities and infrastructure support at the New Brunswick Laboratory (NBL) located on the site of the Argonne National Laboratory (ANL), the Office of Scientific and Technical Information (OSTI) and Oak Ridge Institute for Science Education (ORISE).
- Landlord responsibilities including infrastructure for the 24,000-acre Oak Ridge Reservation and DOE facilities in the city of Oak Ridge, Tennessee. Activities include maintenance of roads, grounds, and other infrastructure; support and improvement of environmental protection, safety, and health; and Payments in Lieu of Taxes (PILT) to Oak Ridge communities.

Nuclear Operations

To support critical DOE nuclear operations, this funding is provided to help manage ORNL's nuclear facilities (i.e., Buildings 7920, 7930, 3525, and 3025E) to current expectations, fully compliant with federal regulations and DOE Directives. This funding provides for end-of-life replacement of critical nuclear complex equipment and infrastructure to assure the facilities continue to meet safe standards and supports corrective and routine preventive maintenance on several thousand nuclear safety and facility support components and equipment located within ORNL's non-reactor nuclear facilities.

Payments in Lieu of Taxes

Funding within this activity supports SC stewardship responsibilities for the Payment in Lieu of Taxes (PILT). The Department is authorized to provide discretionary payments to state and local government authorities for real property that is not subject to taxation because it is owned by the United States and operated by the Department. Under this authorization, PILT is provided to communities around the Argonne and Brookhaven National Laboratories to compensate for lost tax revenues for land removed from local tax rolls. PILT payments are negotiated between the Department and local governments based on land values and tax rates.

**Science Laboratories Infrastructure
Infrastructure Support**

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Infrastructure Support \$13,590,000	\$44,690,000	+\$31,100,000
Facilities and Infrastructure (\$6,100,000)	(\$30, 977,000)	(+\$24,877,000)
Provides funding for general facility and infrastructure support at NBL, OSTI, and ORISE.	This subprogram will fund a suite of infrastructure support investments that focus on laboratory core infrastructure and operations. It will also support Landlord responsibilities for the Oak Ridge Reservation, and PILT payments to the city of Oak Ridge.	This increase addresses top core infrastructure priorities identified as part of the Campus Strategy discussions, and includes projects such as electrical upgrades at SLAC and ANL and renovations at FNAL. It also supports Landlord responsibilities for the Oak Ridge Reservation, and PILT payments to Oak Ridge.
Nuclear Operations (\$0)	(\$12,000,000)	(+\$12,000,000)
Not included in FY 2015.	This funding is provided to manage ORNL's nuclear facilities to current expectations, fully compliant with federal regulations and DOE Directives. These activities have previously been supported by Congressional Direction under the Office of Nuclear Energy.	This increase will support management of ORNL's nuclear facilities to current expectations, fully compliant with federal regulation and DOE Directives.
Oak Ridge Landlord (\$5,777,000)	(\$0)	(-\$5,777,000)
Provides funding for activities to ensure continuity of operations and minimize interruptions due to infrastructure or other system failures. It also supports Landlord responsibilities for the Oak Ridge Reservation, and PILT payments to the city of Oak Ridge.	In FY 2016, this activity is funded within the Facilities and Infrastructure line.	Decrease reflects relocation of this funding activity to the Facilities and Infrastructure line.
Payments in Lieu of Taxes (\$1,713,000)	(\$1,713,000)	(\$0)
Provides funding for PILT payments to communities around the Argonne and Brookhaven National Laboratories.	The FY 2016 request provides funding for PILT payments to communities around the Argonne and Brookhaven National Laboratories.	Funding remains flat.

**Science Laboratories Infrastructure
Construction**

Description

The SLI Construction program funds line-item projects to maintain and enhance the general purpose infrastructure at SC laboratories. SLI's infrastructure modernization construction projects are focused on the accomplishment of long-term science goals and strategies at each SC laboratory.

The FY 2016 budget request includes funding for three of four ongoing projects that were new starts in FY 2015.

On-Going Projects

Infrastructure and Operational Improvements at PPPL (15-SC-75)

The Infrastructure and Operational Improvements project will provide critical improvements to infrastructure and operations that support plasma and fusion-energy sciences research. Existing facilities and infrastructure at PPPL are marginally adequate to support cost-effective research operations. For example, many researchers and engineers are housed in buildings that were originally built in the 1960s and include obsolete and inadequate enclosure, mechanical, electrical, and plumbing systems. This project will rectify the most significant site, building, utility, and other infrastructure deficiencies as part of a comprehensive campus strategic facilities investment plan being developed for PPPL. Completion of this project will result in improved operational efficiency and modernized infrastructure that is essential necessary to support fusion energy sciences research.

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, which was approved on September 17, 2013. The estimated preliminary Total Project Cost (TPC) range for this project is \$21,700,000 to \$26,000,000. This cost range and schedule will be further evaluated and may change prior to CD-2 and until the project baseline is established.

This project was a new start in FY 2015 with full funding requested and appropriated. No additional funding is requested in this FY 2016 budget request.

FY 2015 Milestones	FY 2016 Milestones	FY 2017–2020 Key Milestones
CD-1 – Approve Alternative Selection and Cost Range	CD-2 – Approve Performance Baseline CD-3 – Approve Start of Construction	CD-4 – Approve Project Closeout

Materials Design Laboratory at ANL (15-SC-76)

The Materials Design Laboratory project will support research in materials science in energy and a range of other fields. It will entail construction of a 90,000–150,000 gross square foot high-performance laboratory office building and adjacent building renovations. The existing research buildings at Argonne dedicated to this SC research mission are all more than 40 years old, some as old as 55 years. These structures require frequent repair, resulting in interruptions to research activities, and they are unable to meet modern standards for instruments requiring vibration, electromagnetic and/or thermal stability. Additional supporting functions such as utilities or site modifications may be included in the project, if necessary.

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, which was approved on August 27, 2010. The estimated preliminary TPC range for this project is \$85,500,000 to \$96,000,000. This cost range and project schedule will be further evaluated prior to CD-2.

FY 2016 funding will support construction of this project.

FY 2015 Milestones	FY 2016 Milestones	FY 2017–2020 Key Milestones
CD-1 – Approve Alternative Selection and Cost Range	CD-2 – Approve Performance Baseline	CD-3 – Approve Start of Construction CD-4 – Approve Start of Operations or Project Closeout

Photon Science Laboratory Building at SLAC (15-SC-77)

The Photon Science Laboratory Building project will provide centralized modern laboratory and office space to enable the development and expansion of SLAC’s photon science programs. The Photon Science Laboratory Building will support the Linac Coherent Light Source; the Stanford Synchrotron Radiation Lightsource; the Photon Ultrafast Laser Science and Engineering Institute; and the Stanford Institute for Materials and Energy Sciences. Additional supporting functions such as utilities or site modifications may be included in the project, if necessary.

When this project was proposed for initial funding in the FY 2015 budget request, the scope was to construct a facility that would provide a portion of the space that would eventually be needed on-site to support the increase in photon science users on campus. Since that time, Stanford University has initiated design of a larger facility shell that will be built with University funds. *Utilities and services (e.g., elevators, stairways, building-wide mechanical/electrical/plumbing equipment) for the entire building and framing and furnishing up to 75,000 GSF will be provided.* This presents the Department with an opportunity to build out space in that facility for SLAC use, rather than build new. Because of space efficiencies (*shared elevators, hallways, mechanical closets, etc.*) gained in constructing one building versus two, the Office of Science will acquire approximately 30% more square footage of useable space for the same funding than could be acquired under the original project proposal. Therefore, this project has been re-scoped to fund the build-out of specialized photon science laboratories and related infrastructure in the Stanford University building. This strategic approach allows DOE/SLAC to maximize the science capability by leveraging the Stanford University investment.

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, which was approved on May 11, 2011. The estimated preliminary TPC range for this project is \$49,500,000 to \$57,000,000. This cost range and the project schedule will be further evaluated prior to CD-2.

FY 2016 funding will support continued construction of this project.

FY 2015 Milestones	FY 2016 Milestones	FY 2017–2020 Key Milestones
CD-1 – Approve Alternative Selection and Cost Range	CD-2– Approve Performance Baseline CD-3 – Approve Start of Construction Activities	CD-4 – Approve Start of Operations or Project Closeout

Integrative Genomics Building at LBNL (15-SC-78)

The Integrative Genomics Building project will relocate a significant fraction of the research and operations currently located in commercially leased space onto the main LBNL campus. Portions of the biosciences program at LBNL are located off-site, away from the main laboratory, and dispersed across multiple locations up to 20 miles apart. Collocation of these programs will increase the synergy and efficiency of biosciences and other research at LBNL and will provide a state-of-the-art facility for biosciences research in a collaborative environment close to other key LBNL facilities and programs. Additional supporting functions such as utilities or site modifications may be included in the project, if necessary.

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, which was approved on September 17, 2013. The estimated preliminary TPC range for this project is \$86,400,000 to \$91,500,000. This cost range and the project schedule will be further evaluated prior to CD-2.

FY 2016 funding will support construction of this project.

FY 2015 Milestones	FY 2016 Milestones	FY 2017–2020 Key Milestones
CD-1 – Approve Alternative Selection and Cost Range	CD-2 – Approve Performance Baseline CD-3 – Approve Start of Construction	CD-4 – Approve Project Completion

Science Laboratories Infrastructure

Activities and Explanation of Changes

FY 2015 Enacted	FY 2016 Request	Explanation of Changes FY 2016 vs. FY 2015
Construction \$66,010,000	\$68,910,000	+\$2,900,000
Infrastructure and Operational Improvements at PPPL (15-SC-75) (\$25,000,000)	(\$0)	(-\$25,000,000)
FY 2015 funding supports full design and construction of the project.	Full funding was requested in FY 2015.	Full funding was requested in FY 2015.
Materials Design Laboratory at ANL (15-SC-76) (\$7,000,000)	(\$23,910,000)	(+\$16,910,000)
FY 2015 funding supports full design of the project.	Funding is requested in FY 2016 to initiate construction of the project.	Initiation of construction of the project.
Photon Sciences Laboratory Building at SLAC (15-SC-77) (\$10,000,000)	(\$25,000,000)	(+\$15,000,000)
FY 2015 funding supports full design and the start of construction of the project.	Funding is requested in FY 2016 to support ongoing construction of the project.	Continuation of construction of the project.
Integrative Genomics Building at LBNL (15-SC-78) (\$12,090,000)	(\$20,000,000)	(+\$7,910,000)
FY 2015 funding supports full design of the project.	Funding is requested in FY 2016 to initiate construction of the project.	Initiation of construction of the project.
Science and User Support Building at SLAC (12-SC-70) (\$11,920,000)	(\$0)	(-\$11,920,000)
Funding in FY 2015 will support the continuation of construction activities. FY 2015 is the final year of funding for this project.	Final year of funding was requested in FY 2015.	Funding was requested in FY 2015 to complete construction of the project.

**Science Laboratories Infrastructure
Capital Summary (\$K)**

	Total	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015
General Plant Projects (GPP)							
Linac K-sub							
Remediation at SLAC (TEC \$9.8M)	9,800	0	0	0	0	9,800	+9,800
Wilson Hall Renovations at FNAL (TEC \$9.0M)	9,000	0	0	0	0	9,000	+9,000
Other GPP (TEC <\$5M)	n/a	n/a	300	300	800	4,300	+3,500
Total, General Plant Projects (GPP)			300	300	800	23,100	+22,300

Construction Projects Summary (\$K)

	Total Project Cost(TPC)	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015
Infrastructure and Operational Improvements at PPPL (15-SC-75)							
TEC	25,000 ^a	0	0	0	25,000	0	-25,000
OPC ^b	1,000	0	1,000	1,000	0	0	0
TPC	26,000 ^a	0	1,000	1,000	25,000	0	-25,000
Materials Design Laboratory at ANL (15-SC-76)							
TEC	95,000 ^a	0	0	0	7,000	23,910	+16,910
OPC ^b	1,000	382	300	300	0	0	0
TPC	96,000 ^a	382	0	0	7,000	23,910	+16,910
Photon Sciences Laboratory Building at SLAC (15-SC-77)							
TEC	55,000 ^a	0	0	0	10,000	25,000	+15,000
OPC ^b	2,000	0	671	671	100	492	+392
TPC	57,000 ^a	0	671	671	10,100	25,492	+15,392

^a This project has not received CD-2 approval; therefore, preliminary cost estimates are shown for TEC and TPC.

^b Other Project Costs shown are funded through laboratory overhead.

	Total Project Cost(TPC)	Prior Years	FY 2014 Enacted	FY 2014 Current	FY 2015 Enacted	FY 2016 Request	FY 2016 vs. FY 2015
Integrative Genomics Building at LBNL (15-SC-78)							
TEC	90,000 ^a	0	0	0	12,090	20,000	+7,910
OPC ^b	1,500	0	1,500	1,500	0	0	0
TPC	91,500 ^a	0	1,500	1,500	12,090	20,000	+7,910
Utilities Upgrade at FNAL (13-SC-70)							
TEC	34,900 ^a	0	0	34,900	0	0	0
OPC ^b	1,100	1,100	0	0	0	0	0
TPC	36,000 ^a	1,100	0	34,900	0	0	0
Utility Infrastructure Modernization at TJNAF (13-SC-71)							
TEC	29,200 ^a	0	29,200	29,200	0	0	0
OPC ^b	700	700	0	0	0	0	0
TPC	29,900 ^a	700	29,200	29,200	0	0	0
Science and User Support Building at SLAC (12-SC-70)							
TEC	64,000 ^a	14,512	25,482	25,482	11,920	0	-11,920
OPC ^b	1,000	562	238	238	200	0	-200
TPC	65,000 ^a	15,074	25,720	25,720	12,120	0	-12,120
Research Support Building and Infrastructure Modernization at SLAC (10-SC-70)							
TEC	96,000	83,976	0	0	0	0	0
OPC ^b	1,400	921	230	230	0	0	0
TPC	97,400	84,897	230	230	0	0	0
Total, Construction							
TEC	n/a	n/a	89,582	89,582	66,010	68,910	+2,900
OPC ^b	n/a	n/a	2,968	2,968	300	492	+192
TPC	n/a	n/a	92,550	92,550	66,310	69,402	+3,092

^aThis project has not received CD-2 approval; therefore, preliminary cost estimates are shown for TEC and TPC.

^b Other Project Costs shown are funded through laboratory overhead.

**15-SC-76 Materials Design Laboratory
Argonne National Laboratory (ANL), Argonne, IL
Project is for Design and Construction**

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update of the FY 2015 CPDS and does not include a new start for the budget year.

Summary

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, Approve Mission Need, which was approved on August 27, 2010. The preliminary Total Estimated Cost (TEC) range for this project is \$84,500,000 to \$95,000,000. The estimated preliminary Total Project Cost (TPC) range for this project is \$85,500,000 to \$96,000,000.

A Federal Project Director with the appropriate certification level has been assigned to this project and has approved this CPDS.

2. Critical Milestone History

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2015	08/27/2010	N/A	4Q FY 2014	4Q FY 2015 ^a	4Q FY 2016	3Q FY 2016 ^a	N/A	2Q FY 2020 ^a
FY 2016	08/27/2010	1Q FY 2015	2Q FY 2015	2Q FY 2016 ^a	3Q FY 2017	1Q FY 2017 ^a	N/A	3Q FY 2020 ^a

CD-0 – Approve Mission Need

CD-1 – Approve Alternative Selection and Cost Range

CD-2 – Approve Performance Baseline

CD-3 – Approve Start of Construction

CD-4 – Approve Start of Operations or Project Closeout

Performance Baseline Validation

FY 2015 N/A

FY 2016 1Q FY 2017^a

^a This project is pre-CD-2 and schedule estimates are preliminary.

3. Project Cost History

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC ^a Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	7,000	88,000 ^b	95,000 ^b	1,000	N/A	1,000	96,000 ^b
FY 2016	7,000	88,000 ^b	95,000 ^b	1,000	N/A	1,000	96,000 ^b

4. Project Scope and Justification

Scope

The Materials Design Laboratory project is proposed to construct a 90,000 to 150,000 square foot high performance laboratory building with efficient, high-accuracy heating, ventilation, and air conditioning systems.. Additional supporting functions such as utilities or site modifications may be included in the project, if they are deemed necessary. Alternatives will be evaluated prior to CD-1 during acquisition strategy development. Preliminary project Key Performance Parameters are as follows:

Description	Threshold Value (Minimum)	Objective Value (Maximum)
Multistory Laboratory Building	90,000 gross square feet	150,000 gross square feet

Justification

Office of Science (SC) research at ANL supports the development of revolutionary materials and novel molecular processes to transform global energy production and storage. The Materials Design Laboratory will provide the modern collaborative scientific environment critical for this initiative to thrive and will focus on four themes central to implementing the Materials for Energy strategy:

- Frontiers of materials and molecular synthesis, and fabrication of devices;
- Interfacial engineering for energy applications;
- Materials under extreme conditions; and
- In situ characterization and modeling.

Ongoing research at ANL requires flexible and sustainable laboratory and office space needed to support scientific theory/simulation, materials discovery, characterization, and application of new energy-related materials and processes. Efficient, high-accuracy heating, ventilation, and air conditioning systems will be installed to support cutting edge research and the operation of sensitive instrumentation. Comparable space is not currently available at ANL.

FY 2015 funds will be used for preliminary and final design, project management, and support activities. FY 2016 funds will be used for final design, construction, project management, and support activities.

The project has an exemption from the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets; however, the project is being conducted in accordance with the project management requirements in DOE O 413.3B, and all appropriate project management requirements have been met.

^a Other Project Costs (OPC) are funded through laboratory overhead.

^b This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range for this project is \$84,500,000 to \$95,000,000. The preliminary TPC range for this project is \$85,500,000 to \$96,000,000.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	7,000	7,000	6,000
FY 2016	0	0	1,000
Total, Design	7,000	7,000	7,000
Construction			
FY 2016	23,910	23,910	18,000
FY 2017	25,090	25,090	20,000
FY 2018	39,000	39,000	25,000
FY 2019	0	0	25,000
Total, Construction	88,000	88,000	88,000
TEC			
FY 2015	7,000	7,000	6,000
FY 2016	23,910	23,910	19,000
FY 2017	25,090	25,090	20,000
FY 2018	39,000	39,000	25,000
FY 2019	0	0	25,000
Total, TEC ^a	95,000	95,000	95,000
Other Project Cost (OPC) ^b			
OPC except D&D			
FY 2010	412	412	412
FY 2011	-30 ^c	-30 ^c	-30 ^c
FY 2014	300	300	300
FY 2018	318	318	318
Total, OPC except D&D	1,000	1,000	1,000

^a This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range for this project is \$84,500,000 to \$95,000,000. The preliminary TPC range for this project is \$85,500,000 to \$96,000,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.

^c OPC Funding was adjusted in FY 2011 to reflect FY 2010 actuals (\$382,000 for OPC funding in FY 2010).

(dollars in thousands)

Appropriations	Obligations	Costs
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Total Project Cost (TPC)

FY 2010	412	412	412
FY 2011	-30 ^a	-30 ^a	-30 ^a
FY 2014	300 ^b	300	300
FY 2015	7,000	7,000	6,000
FY 2016	23,910	23,910	19,000
FY 2017	25,090	25,090	20,000
FY 2018	39,318	39,318	25,318
FY 2019	0	0	25,000
Total, TPC ^c	96,000	96,000	96,000

6. Details of Project Cost Estimate

(dollars in thousands)

Current Total Estimate	Previous Total Estimate	Original Validated Baseline
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Total Estimated Cost (TEC)

Design

Design	6,000	5,900	N/A
Contingency	1,000	1,100	N/A
Total, Design	7,000	7,000	N/A

Construction

Construction	73,000	72,000	N/A
Contingency	15,000	16,000	N/A
Total, Construction	88,000	88,000	N/A

^a OPC Funding was adjusted in FY 2011 to reflect FY 2010 actuals (\$382,000 for OPC funding in FY 2010).

^b Conceptual Design Cost estimate will be updated to depict actual costs when incurred.

^c This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range for this project is \$84,500,000 to \$95,000,000. The preliminary TPC range for this project is \$85,500,000 to \$96,000,000.

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total, TEC ^a	95,000	95,000	N/A
Contingency, TEC	16,000	17,100	N/A
Other Project Cost (OPC) ^b			
OPC except D&D			
Conceptual Planning	382	382	N/A
Conceptual Design	500	400	N/A
Contingency	118	218	N/A
Total, OPC	1,000	1,000	N/A
Contingency, OPC	118	218	N/A
Total, TPC ^a	96,000	96,000	N/A
Total, Contingency	16,118	17,318	N/A

7. Schedule of Appropriation Requests

Request Year		(\$K)						Total
		Prior Years	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	
FY 2015	TEC	0	0	7,000	24,003	36,466	27,531	95,000 ^a
	OPC ^b	382	500	0	0	0	118	1,000
	TPC	382	500	7,000	24,003	36,466	27,649	96,000 ^a
FY 2016	TEC	0	0	7,000	23,910	25,090	39,000	95,000 ^a
	OPC ^b	382	300	0	0	0	318	1,000
	TPC	382	300	7,000	23,910	25,090	39,318	96,000 ^a

^a This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range for this project is \$84,500,000 to \$95,000,000. The preliminary TPC range for this project is \$85,500,000 to \$96,000,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.

8. Related Operations and Maintenance Funding Requirements

Not Applicable

9. D&D Information

The new area being constructed in this project is not replacing existing facilities.

	Square Feet
New area being constructed by this project at <i>Argonne National Laboratory</i>	90,000 to 150,000
Area of D&D in this project at <i>Argonne National Laboratory</i>	None
Area at <i>Argonne National Laboratory</i> to be transferred, sold, and/or D&D outside the project including area previously “banked”	None
Area of D&D in this project at other sites	None
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously “banked”	90,000 to 150,000
Total area eliminated	None

Argonne will comply via the FY 2012 waiver from EM ETP to Argonne. Argonne’s net banked square footage as reported in the FY 2013 Report on DOE’s disposition of excess real property for future one-for-one offsets stands at 577,955 SF.

10. Acquisition Approach

The M&O Contractor, UChicago Argonne, LLC, will have prime responsibility for oversight of both the design and construction subcontracts. The M&O Contractor has extensive experience in the management and oversight of contracts of equal or greater complexity than the proposed Material Design Laboratory. The M&O Contractor’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.

Various acquisition alternatives will be considered for this project. After considering all alternatives in relation to the schedule, size, and risk, the use of a tailored Design-Bid-Build approach with design by an Architectural/Engineering firm, construction management (CM) services through the industrial partnership, and construction by a General Contractor (GC), all led by the M&O Contractor integrated project team, may provide the best construction delivery method and the lowest risk. In addition, the M&O Contractor’s standard procurement practice is to use firm fixed-priced contracts and the M&O Contractor has extensive experience in project management, construction management, and environmental, safety, and health (ES&H) management systems in the acquisition of scientific facilities.

15-SC-77 Photon Science Laboratory Building
SLAC National Accelerator Laboratory, Menlo Park, California
Project is for Design and Construction

1. Significant Changes and Summary

Significant Changes

When this project was proposed for initial funding in the FY 2015 budget request, the scope was to construct a DOE-owned facility that would provide a portion of the space that would eventually be needed on-site to support the increase in photon science users on campus. Since that time, Stanford University has initiated design and construction of a larger facility shell that will be built with University funds. This presents the Department with an opportunity to build out space in that facility for SLAC use, rather than build a new, DOE-owned facility. Because of space efficiencies (shared elevators, hallways, mechanical closets, etc.) gained in constructing one building versus two, the Office of Science (SC) will gain approximately 30% more square footage of useable space for the same investment (\$55M Total Project Cost) as could be acquired under the original project proposal. Therefore, this project is re-scoped to fund the build-out of specialized photon science laboratories and related infrastructure in a portion of the Stanford University. This strategic approach allows DOE/SLAC to maximize the science capability by leveraging the Stanford University investment.

Briefings to Congressional Staff were conducted prior to the FY 2015 Appropriations. The purpose of the briefings was to ensure that all parties were aware and accepting of the re-scoped project and the benefits derived by fitting out a building donated to and owned by Stanford University.

Summary

The most recent DOE O 413.3B approved Critical Decision (CD) is CD-0, *Approve Mission Need*, which was approved April 18, 2011. The preliminary Total Estimated Cost (TEC) range for the DOE funded portion of this project is \$47,500,000 to \$55,000,000. The estimated preliminary Total Project Cost (TPC) range for the DOE funded portion of this project is \$49,500,000 to \$57,000,000.

A Federal Project Director with the appropriate certification level has been assigned to this project and has approved this CPDS.

2. Critical Milestone History

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	D&D Complete	CD-4
FY 2015	4/18/2011	N/A	1Q FY 2015	4Q 2015 ^a	1Q FY 2017	3Q FY 2016 ^a	N/A	1Q FY 2019 ^a
FY 2016	4/18/2011	3Q FY 2015	3Q FY 2015	1Q 2016 ^a	3Q FY 2016	3Q FY 2016 ^a	N/A ^b	2Q FY 2018 ^a

CD-0 – Approve Mission Need

CD-1– Approve Alternative Selection and Cost Range

CD-2 – Approve Performance Baseline

CD-3 – Approve Start of Balance of Construction Activities

CD-4 – Approve Start of Operations or Project Closeout

^a This project is pre-CD-2 and schedule estimates are preliminary.

^b The project is not building additional space; therefore, D&D is not applicable.

Performance Baseline Validation

FY 2015	N/A
FY 2016	4Q FY 2016 ^a

3. Project Cost History

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC ^b Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	4,000	51,000 ^c	55,000	2,000	0	2,000 ^c	57,000 ^c
FY 2016	6,000	49,000 ^c	55,000	2,000	0	2,000 ^c	57,000 ^c

4. Project Scope and Justification

Scope

To accommodate the growth in research program that has occurred since 2011 and has accelerated in the last few years, modern laboratory/office space is needed above and beyond the existing campus space for a range of simulation, theory and modeling, synthetic and characterization capabilities. The lab/office space will also support research collaborations with outside scientists engaged with SLAC's Linac Coherent Light Source (LCLS) and Stanford Synchrotron Radiation Lightsource (SSRL) user facilities. Upon construction of the shell by the Stanford University, the PSLB project will prepare a large portion of the shell's interior for SLAC use. Utilities and services (e.g., elevators, stairways, building-wide mechanical/electrical/plumbing equipment) for the entire building and framing and furnishing up to 75,000 GSF will be provided. The fit out will be designed and constructed in order to operate a complete and usable facility. The government will maximize the use of appropriated funds by 30% as compared to the concept envisioned at CD-0. These alternatives and the life cycle cost analysis will be studied at CD-1.

Alternatives will be evaluated prior to CD-1 during acquisition strategy development. Preliminary project Key Performance Parameters are as follows:

Description	Threshold Value (Minimum)	Objective Value (Maximum)
Laboratory building interior fit out	60,000 gross square feet	75,000 gross square feet

Justification

Fit out by the Office of Science of the Photon Science Laboratory Building is needed to provide centralized modern laboratory and office space with the necessary performance capabilities and accommodate growth in the existing photon science program. The Photon Science Laboratory Building would leverage the capabilities of two of the country's world-class light sources, LCLS and SSRL, as well as the Photon Ultrafast Laser Science and Engineering (PULSE) and Stanford Institute for Materials and Energy Sciences (SIMES) photon institutes. Without modern facilities suitable for collocated and coordinated

^a This project is pre-CD-2 and schedule estimates are preliminary.

^b Other Project Costs (OPC) are funded through laboratory overhead.

^c This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC cost range for this project is \$47,500,000 to \$55,000,000. The preliminary TPC cost range for this project is \$49,500,000 to \$57,000,000.

functionality, the laboratory’s ability to successfully address and deliver on the long term strategic mission of the laboratory will be limited.

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. SLAC was built in 1962 to perform research in accelerator-based particle physics. Expansion and upgrade of the SSRL and the LCLS located at SLAC are producing rapid increases to photon science facility use, thereby increasing the need for space to accommodate the new and expanded research program.

FY 2015 funds will be used for preliminary and final design, and project management and support activities. FY 2016 funds will be used for construction and project management and support activities.

The project has an exemption from the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets; however, the project is being conducted in accordance with the project management requirements in DOE O 413.3B, and all appropriate project management requirements have been met.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	6,000	6,000	3,500
FY 2016	0	0	2,000
FY 2017	0	0	500
Total, Design	6,000	6,000	6,000
Construction			
FY 2015	4,000	4,000	0
FY 2016	25,000	25,000	12,500
FY 2017	20,000	20,000	34,500
FY 2018	0	0	2,000
FY 2019	0	0	0
Total, Construction	49,000	49,000	49,000

(dollars in thousands)

Appropriations	Obligations	Costs
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TEC

FY 2015	10,000	10,000	3,500
FY 2016	25,000	25,000	14,500
FY 2017	20,000	20,000	35,000
FY 2018	0	0	2,000
Total, TEC ^a	55,000	55,000	55,000

Other Project Cost (OPC)^b

OPC except D&D

FY 2014	671	671	671
FY 2015	100	100	100
FY 2016	492	492	492
FY 2017	737	737	737
Total, OPC except D&D	2,000	2,000	2,000

Total Project Cost (TPC)

FY 2014	671	671	671
FY 2015	10,100	10,100	3,600
FY 2016	25,492	25,492	14,992
FY 2017	20,737	20,737	35,737
FY 2018	0	0	2,000
Total, TPC ^a	57,000	57,000	57,000

^a This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC cost range for this project is \$47,500,000 to \$55,000,000. The preliminary TPC cost range for this project is \$49,500,000 to \$57,000,000.

^b Other Project Costs are funded through laboratory overhead.

6. Details of Project Cost Estimate

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Total Estimated Cost (TEC)			
Design			
Design	5,000	3,300	N/A
Contingency	1,000	700	N/A
Total, Design	6,000	4,000	N/A
Construction			
Construction	40,500	42,500	N/A
Contingency	8,500	8,500	N/A
Total, Construction	49,000	51,000	N/A
Total, TEC^a	55,000	55,000	N/A
Contingency, TEC	9,500	9,200	N/A
Other Project Cost (OPC)^b			
OPC except D&D			
Conceptual Design	1,200	1,200	N/A
Start-Up	450	450	N/A
Contingency	350	350	N/A
Total, OPC	2,000	2,000	N/A
Contingency, OPC	350	350	N/A
Total, TPC^a	57,000	57,000	N/A
Total, Contingency	9,850	9,550	N/A

^a This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC cost range for this project is \$47,500,000 to \$55,000,000. The preliminary TPC cost range for this project is \$49,500,000 to \$57,000,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.

7. Schedule of Appropriation Requests

Request		(\$K)				
Year		FY 2014	FY 2015	FY 2016	FY 2017	Total
FY 2015	TEC	0	12,890	25,770	16,340	55,000 ^a
	OPC ^b	1,341	0	200	459	2,000
	TPC	1,341	12,890	25,970	16,799	57,000 ^a
FY 2016	TEC	0	10,000	25,000	20,000	55,000 ^a
	OPC ^b	671	100	492	737	2,000
	TPC	671	10,100	25,492	20,737	57,000 ^a

8. Related Operations and Maintenance Funding Requirements

Start of Construction or Beneficial Occupancy (fiscal quarter and year)	3Q FY 2018
Expected Useful Life (number of years)	50
Expected Future Start of D&D of this capital asset (fiscal quarter and year)	3Q FY 2068

(Related Funding requirements)

(dollars in thousands)

	Annual Costs		Life Cycle Costs	
	Current Total Estimate	Previous Total Estimate	Current Total Estimate	Previous Total Estimate
Operations	240	240	12,000	12,000
Maintenance	460	460	23,000	23,000
Total, Operations & Maintenance ^c	700	700	35,000	35,000

9. D&D Information

Square Feet

New area being constructed by this project at <i>SLAC National Accelerator Laboratory</i> ..	N/A
Area of D&D in this project at <i>SLAC National Accelerator Laboratory</i>	N/A
Area at <i>SLAC National Accelerator Laboratory</i> to be transferred, sold, and/or D&D outside the project including area previously "banked"	N/A

^a This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC cost range for this project is \$47,500,000 to \$55,000,000. The preliminary TPC cost range for this project is \$49,500,000 to \$57,000,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.

^c This project does not have CD-1 approval; the O&M funding requirements have been based on parametric comparison of similar Argonne new building construction. Actual O&M funding requirements will be developed at CD-1.

Square Feet

Area of D&D in this project at other sites.....	N/A
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously “banked”	N/A
Total area eliminated.....	N/A

SLAC National Accelerator Laboratory net banked square footage for future one-for-one offset as reported in FIMS stands at 263,000 SF. Since there will not be construction of any additional space in this project, the one-for-one offset is not applicable.

10. Acquisition Approach

Acquisition for this project will be performed by the SLAC Management and Operating (M&O) contractor, Stanford University. The M&O contractor is responsible for awarding and managing all subcontracts related to this project. The M&O contractor will evaluate various acquisition alternatives and project delivery methods prior to achieving CD-1. Potential acquisition and project delivery methods include, but are not limited to, firm fixed price contracts for design-bid-build and design-build. The M&O contractor will also evaluate potential benefits of using a single or multiple contracts to procure materials, equipment, construction, commissioning and other project scope elements. Project performance metrics for SLAC will be included in the M&O contractor’s annual performance and evaluation measurement plan.

**15-SC-78, Integrative Genomics Building
Lawrence Berkeley National Laboratory (LBNL), Berkeley, California
Project is for Design and Construction**

1. Significant Changes and Summary

Significant Changes

This Construction Project Data Sheet (CPDS) is an update of the FY 2015 CPDS and does not include a new start for the budget year.

Summary

The first DOE O 413.3B Critical Decision (CD) is CD-0, Approve Mission Need, was approved on September 17, 2013. The preliminary Total Estimated Cost (TEC) range for this project is \$84,900,000 to \$90,000,000. The preliminary Total Project Cost (TPC) range for this project is \$86,400,000 to \$91,500,000.

A Federal Project Director with the appropriate certification level has been assigned to this project and has approved this CPDS.

The revised tailoring of CDs no longer reflects Phases A and B but only start of construction under CD-3.

The budgeted amount for PED funds in FY 2015 is reduced by \$2,500,000 to \$9,590,000 to reflect a slightly less conservative cost estimate for preliminary and final design.

2. Critical Milestone History

(fiscal quarter or date)

	CD-0	Conceptual Design Complete	CD-1	CD-2	Final Design Complete	CD-3	CD-3B	D&D Complete	CD-4
FY 2015	9/17/2013	N/A	1Q FY 2015 ^a	3Q FY 2016 ^a	4Q FY 2016 ^a	3Q FY 2016 ^a	1Q FY 2017 ^a	N/A	1Q FY 2021 ^a
FY 2016	9/17/2013	1Q FY 2015	2Q FY 2015 ^a	2Q FY 2016 ^a	3Q FY 2016 ^a	4Q FY 2016 ^a	N/A	N/A	1Q FY 2021 ^a

CD-0 – Approve Mission Need

CD-1 – Approve Alternative Selection and Cost Range

CD-2 – Approve Performance Baseline

CD-3 – Approve Start of Construction

CD-4 – Approve Project Completion

^a This project is pre-CD-2, and the schedule is preliminary. Construction funds will not be executed without appropriate CD approvals.

Performance Baseline Validation ^a
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FY 2015 N/A

FY 2016 N/A

3. Project Cost History

(dollars in thousands)

	TEC, Design	TEC, Construction	TEC, Total	OPC ^b Except D&D	OPC, D&D	OPC, Total	TPC
FY 2015	12,090	77,910 ^c	90,000 ^c	1,500	0	1,500 ^b	91,500 ^c
FY 2016	9,590	80,410 ^a	90,000 ^c	1,500	0	1,500 ^b	91,500 ^c

4. Project Scope and Justification

Scope

This project will fill the present capability gaps by providing a state-of-the-art facility for biosciences research and other programs. Preliminary tailoring of project scope includes an initial site preparation (Phase A) and main building construction (Phase B) which will be determined at CD-2. Additional supporting functions such as utilities or site modifications may be included in the project, if they are deemed necessary.

This project has not yet received CD-1 approval; therefore Key Performance Parameters (KPPs) are to be determined. The table below outlines preliminary KPPs.

Key Performance Parameters (Preliminary)

Description	Threshold Value (Minimum)	Objective Value (Maximum)
Biosciences and other research space	75,000 gross square feet	95,000 gross square feet

Justification

The mission need of this project is to increase the synergy and efficiency of biosciences and other research at Lawrence Berkeley National Laboratory (LBNL). LBNL has grown from a pioneering particle and nuclear physics laboratory into a multidisciplinary research facility with broad capabilities in physical, chemical, computational, biological, and environmental systems research in support of the Department of Energy (DOE) mission. Portions of the biosciences program at LBNL are located off-site, away from the main laboratory, and dispersed across several locations approximately twenty miles apart. This arrangement has produced research and operational capability gaps that limit scientific progress, in genomics-based biology related to energy and the environment.

^a This project is pre-CD-2, and the schedule is preliminary. Construction funds will not be executed without appropriate CD approvals.

^b Other project costs (OPC) are funded through laboratory overhead.

^c This project has not received CD-2 approval; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range for this project is \$84,900,000 to \$90,000,000. The preliminary TPC range for this project is \$86,400,000 to \$91,500,000.

FY 2015 funds will be used for preliminary and final design, project management and support activities, and construction. FY 2016 funds will be used for construction and project management and support activities.

The project has an exemption from the project management requirements in DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets; however, the project is being conducted in accordance with the project management requirements in DOE O 413.3B, and all appropriate project management requirements have been met.

5. Financial Schedule

(dollars in thousands)

	Appropriations	Obligations	Costs
Total Estimated Cost (TEC)			
Design			
FY 2015	9,590	9,590	4,795
FY 2016	0	0	4,795
Total, Design	9,590	9,590	9,590
Construction			
FY 2015	2,500	2,500	0
FY 2016	20,000	20,000	4,000
FY 2017	25,064	25,064	16,410
FY 2018	32,846	32,846	24,000
FY 2019	0	0	24,000
FY 2020	0	0	12,000
Total, Construction	80,410	80,410	80,410
TEC			
FY 2015	12,090	12,090	4,795
FY 2016	20,000	20,000	8,795
FY 2017	25,064	25,064	16,410
FY 2018	32,846	32,846	24,000
FY 2019	0	0	24,000
FY 2020	0	0	12,000
Total, TEC ^a	90,000	90,000	90,000

^a This project has not received approval of CD-2; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range is \$84,900,000 to \$90,000,000. The preliminary TPC range is \$86,400,000 to \$91,500,000.

(dollars in thousands)

Appropriations	Obligations	Costs
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Other Project Cost (OPC)^a

OPC except D&D

FY 2014	1,500	1,500	1,145
FY 2015	0	0	355
Total, OPC	1,500	1,500	1,500

Total Project Cost (TPC)

FY 2014	1,500	1,500	1,145
FY 2015	12,090	12,090	5,150
FY 2016	20,000	20,000	8,795
FY 2017	25,064	25,064	16,410
FY 2018	32,846	32,846	24,000
FY 2019	0	0	24,000
FY 2020	0	0	12,000
Total, TPC ^a	91,500	91,500	91,500

6. Details of Project Cost Estimate

(dollars in thousands)

Current Total Estimate	Previous Total Estimate	Original Validated Baseline
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Total Estimated Cost (TEC)

Design

Design	8,590	10,590	N/A
Contingency	1,000	1,500	N/A
Total, Design	9,590	12,090	N/A

^a Other Project Costs (OPC) are funded through laboratory overhead.

(dollars in thousands)

	Current Total Estimate	Previous Total Estimate	Original Validated Baseline
Construction			
Construction	68,210	61,410	N/A
Contingency	12,200	16,500	N/A
Total, Construction	80,410	77,910	N/A
Total, TEC^a	90,000	90,000	N/A
Contingency, TEC	13,200	18,000	N/A
Other Project Cost (OPC)^b			
OPC except D&D			
Conceptual Planning	400	400	N/A
Conceptual Design	1,000	500	N/A
Startup	0	200	N/A
Contingency	100	400	N/A
Total, OPC	1,500	1,500	N/A
Contingency, OPC	100	400	N/A
Total, TPC^a	91,500	91,500	N/A
Total, Contingency	13,300	18,400	N/A

7. Schedule of Appropriation Requests

Request Year		(\$K)						Total
		FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	
FY 2015	TEC	0	12,090	17,299	30,148	30,463	0	90,000 ^a
	OPC ^b	1,300	0	0	0	0	200	1,500
	TPC	1,300	12,090	17,299	30,148	30,463	200	91,500 ^a

^a This project has not received approval of CD-2; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range is \$84,900,000 to \$90,000,000. The preliminary TPC range is \$86,400,000 to \$91,500,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.

Request Year		(\$K)						Total
		FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	
FY 2016	TEC	0	12,090	20,000	25,064	32,846	0	90,000 ^a
	OPC ^b	1,500	0	0	0	0	0	1,500
	TPC	1,500	12,290	20,000	25,064	32,846	0	91,500 ^a

8. Related Operations and Maintenance Funding Requirements

Not Applicable

9. D&D Information

The new area that will be constructed in this project will not replace existing facilities.

	Square Feet
New area being constructed by this project at <i>Lawrence Berkeley National Laboratory</i>	75,000 to 95,000
Area of D&D in this project at <i>Lawrence Berkeley National Laboratory</i>	None
Area at <i>Lawrence Berkeley National Laboratory</i> to be transferred, sold, and/or D&D outside the project including area previously “banked”	75,000 to 95,000
Area of D&D in this project at other sites.....	None
Area at other sites to be transferred, sold, and/or D&D outside the project including area previously “banked”	None
Total area eliminated	None

Lawrence Berkeley National Laboratory will comply via space previously “banked.” Lawrence Berkeley National Laboratory net banked square footage for future one-for-one offset as reported in the last FIMS update of September 26, 2013 stands at 165,000 SF.

10. Acquisition Approach

Acquisition for this project will be performed by the LBNL Management and Operating (M&O) contractor, University of California. The M&O contractor is responsible for awarding and managing all subcontracts related to this project. The M&O contractor will evaluate various acquisition alternatives and project delivery methods prior to achieving CD-1. Potential acquisition and project delivery methods include, but are not limited to, firm fixed price contracts for design-bid-build and design-build. The M&O contractor will also evaluate potential benefits of using a single or multiple contracts to procure materials, equipment, construction, commissioning and other project scope elements. Project performance metrics for LBNL will be included in the M&O contractor’s annual performance and evaluation measurement plan.

^a This project has not received approval of CD-2; funding estimates are consistent with the high end of the preliminary cost ranges. The preliminary TEC range is \$84,900,000 to \$90,000,000. The preliminary TPC range is \$86,400,000 to \$91,500,000.

^b Other Project Costs (OPC) are funded through laboratory overhead.