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Facilities Quarterly

LAWRENCE BERKELEY LABORATORY FACILITIES DEPARTMENT NEWSLETTER

JULY
1994

CONSTRUCTION INSPECTION

At LBL construction inspection is an integral part of the construction process. Willy Lopez, Chief Inspector, and his four-member inspection team, are on hand throughout

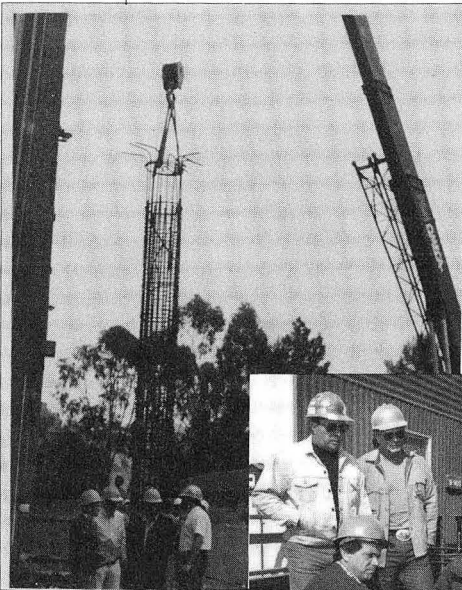
all construction projects to ensure that work is completed according to contract details and construction and safety codes. The inspectors are concerned with code compliance not only for the structure itself, but also for the safety of

construction workers and LBL employees. Inspection also helps to ensure that work is done right the first time; early discovery of construction and safety problems avoids expensive rework and delays.

Inspection group reorganization. Two years ago, the Facilities inspection group was restructured to report directly to department head Bob Camper, rather than to project management. This has improved the ability of the inspectors to act independently to enforce code compliance. A potential conflict of interests between the project managers, who are primarily responsible for the project scope, schedule, and budget, and the inspectors, who are responsible for code compliance, has been turned into a system of checks and balances, with the mutual goal of on-time quality construction within budget. Inspection has been extended to include construction performed by M&O, previously inspected by craft supervisors, providing independent verification and a fresh viewpoint.

The inspection process. During the project design phase Facilities prepares a construction contract. The contract requires the contractor to perform work according to plans and specifications detailed in the contract, along with quality assurance requirements for each component of the project—concrete, steel and wood structures; electrical,

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The inspection team is on hand to inspect the steel reinforcing caissons that will provide seismic support for Bldg 90.



SURPLUS FACILITIES

As an outcome of DOE's Surplus Facility Inventory and Assessment (SFIA) Project, LBL's Bevalac (Bldgs 51 and 71) have been declared high ranking surplus contaminated facilities, along with 60 other DOE-wide buildings and structures. What does this mean for the Lab?

SFIA project. In an effort to define the magnitude of the increasing number of surplus facilities resulting from changing mission priorities and declining budgets, DOE initiated the SFIA project in Oct 93. DOE facilities were asked to inventory their buildings and structures, identify surplus contaminated facilities and assess their condition,

potential hazards, and maintenance budget needs. A Site Implementation and Coordination (SIC) Team including Jackie Thomas (EH&S), Rick Gough (AFRD), and Tina Loo and Rich McClure (Facilities) is coordinating the SFIA project at LBL.

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PUB-678

INSPECTION

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plumbing, ventilation and air conditioning systems; life safety systems such as fire assemblies, sprinklers and detection systems; roofs, etc. To catch problems prior to construction, and avoid expensive corrections, the inspectors and others review this document closely before it is sent out for bid.

During construction the inspectors work closely with the project manager, architects, engineers, Fire Dept, M&O, EH&S, and others to resolve code compliance issues. Violations may result from contract problems or faulty work or materials. The inspector works out contract changes with the project manager. For workmanship or materials problems, the inspector warns the contractor. As a last resort the matter is

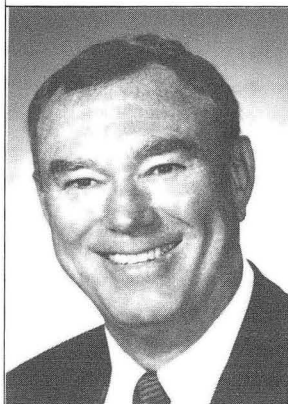
referred to the project manager. Violations must be cleared by the end of construction.

The inspectors. Building and safety codes are extensive, and inspectors must always be prepared to give a detailed code reference for any violation cited. Each of LBL's inspectors has more than 12 years of construction experience, including general construction, inspection and construction management. Each inspector under Lopez also has an area of specialization: Danny Fernandez specializes in concrete and masonry, Larry Bell in steel construction and welding, and Hank Hettinger in electrical systems. Dean Dye has extensive experience as a resident inspector on major projects. Facilities is working with EH&S to hire a safety inspector.

Inspectors must be skilled in negotiation and conflict resolution. A contractor may object strongly when work has to be delayed to correct a code violation. The inspector must handle these confrontations amiably, but be forceful when necessary. The temperament required of the inspector is expressed by a sign in the inspector's office: "Arguing with an inspector is like wrestling with a pig in the mud—after a while you realize that the pig enjoys it."

Chief Inspector Lopez does enjoy his work, admitting to an "intense liking for construction and anything that relates to it." In addition, Lopez is an extremely dedicated person, whose commitment to code compliance is backed up with 15 years as an inspector at LBL, preceded by 7 years as an inspector and architect, and degrees in architecture and electronics.

With improved effectiveness, coordination, and communication, the inspection group has established a strong, independent presence in the construction process. The group's skill, experience and dedication are vital to the quality and safety of construction at LBL.



FROM THE FACILITY MANAGER...

The Facilities Department continues to consolidate functions to reduce costs and provide more uniform service to the Laboratory. In this issue of Facilities Quarterly you will read about the construction inspectors who now inspect all construction work, including minor projects done in-house by the shops. There is also an article on the consolidation of the two estimating offices within the department. This consolidation will

ensure that our customers receive the most accurate estimate possible and that a feedback loop will be in place to monitor actual costs against initial estimates.

The Work Request Center continues to evolve into a one-stop referral center for the Lab. We have recently completed discussions with OAA to have the WRC receive all LSAD institutional deficiencies. A new procedure will be published soon to describe how this will operate. We are continuing to work with other departments at the Lab to incorporate requests for their services into the WRC.

We have met recently with Lowell Ely (LM-10) from DOE headquarters to discuss the MEL-FS program, which is our source of funds for capital projects to replace and repair the infrastructure. LBL did not receive a new start in 1994 and probably will not receive one in 1995. We worked closely with Lowell to identify and prioritize the infrastructure needs of the Laboratory and received his help in restructuring some of our projects to make them fit the new guidelines from DOE. We hope to receive a new project in 1996.

The Facilities Department has chartered three new Process Improvement Teams. Tom Hill is leading one to build on the findings of an earlier PIT on preventive maintenance, Gizella Kapus is leading a team to simplify internal procedures for initiating projects, and Pat Hall's team is reviewing internal reports in order to eliminate or consolidate duplicative or obsolete reports.

We also meet with DOE-OAK on a regular basis to find ways of reducing delays in the approval processes. At present, both offices think that if they work more closely at the beginning stages of a project, DOE will be more familiar with the project and need less review time. We are also exploring a higher level of delegation to the Lab to reduce the number of projects that require review by DOE.

Bob Camper

FACILITIES DEPARTMENT

Facilities provides LBL with a full range of architect and engineering, construction, and maintenance services for new facilities and modification and support of existing facilities.

Architect and engineering services include planning, programming, design, project management, and construction management for new facilities and modifications to existing facilities. Maintenance and construction functions include custodial, gardening, and lighting services; operation, service, and minor repairs and replacements to equipment and utility systems; and construction of modifications, alterations, and

additions to buildings, equipment, facilities, and utilities.

Ongoing Facilities activities include renewal and upgrade of site utility systems and building equipment; preparation of environmental planning studies; in-house energy management, space planning; and assurance of Laboratory compliance with appropriate facilities-related regulations and with University and DOE policies and procedures.

The Work Request Center can expedite any facility-related work request, answer questions, and provide other support for your facilities-related needs.

FOCUS ON SERVICE: HVAC SHOP

This is an especially busy time of year for the Heating, Ventilation, Air Conditioning and Refrigeration (HVAC&R) Shop since summer heat has air conditioning and refrigeration systems under heavy loads.

The Shop is responsible for design review, construction and modification of LBL's HVAC&R systems. They also troubleshoot, repair, test, adjust and balance HVAC&R systems, and carry out routine maintenance.

A year ago, we reported on the HVAC&R Shop's vigorous ozone-depleting substance reduction program. Progress continues; conversion of refrigeration units to non-CFC refrigerants is ongoing, and equipment using CFC's

continues to be phased out. Recovery and recycling of refrigerants has become routine. Leak detection equipment is being installed for all mechanical rooms and connection to the EMCS promotes early detection and repair of leaks, reducing accidental venting and saving money. DOE has funded a \$130K program for CFC replacement of walk-in and reach-in refrigeration systems, and more proposals are awaiting funding.

Avoiding introduction of CFC refrigerant systems is an important component during review of new projects. While this is effective for filtering out CFC equipment in larger systems, for smaller refrigerators, HVAC&R

Supervisor Ken Fletcher has been working with EH&S and Purchasing to intercept orders for systems using CFC's for review of the feasibility of substituting non-CFC equipment.

While the Shop's central responsibility is for HVAC&R equipment that is part of the LBL physical plant facility, a substantial proportion of their work is support on request for programmatic equipment. As Fletcher says, "Our main focus is on customer service, and always has been." The group is dedicated to quick response and quality, cost-effective, efficient work. Contact the WRC for HVAC&R preventive maintenance or repairs and for help in evaluating non-CFC refrigeration retrofits and replacement.

WORK REQUEST CENTER

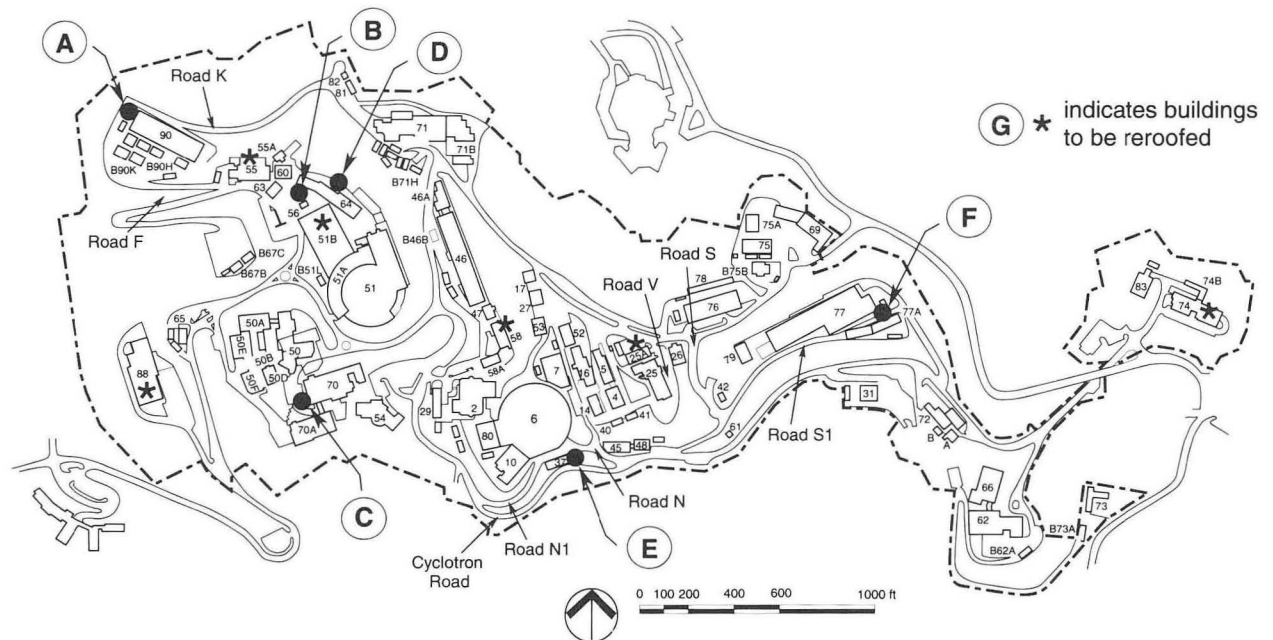
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COMPLIMENTS

- NCEM Director Ulrich Dahmen cited Danica Truchlikova, Kirk Haley and support staff for "fast, efficient action to help develop future scientific projects" in preparing a CDR for the EBMF project.
- John Gonzales of DOE/OAK praised Bert Schleifer and staff for "a job well done at the FY 1996 Project Validations," and described the Planning Group's 1994 Site Development Plan and Laboratory Integrated Facilities Plan efforts as a "model for other DOE sites."
- Donner Lab Bldg Mgr Rita Cummings tipped her hat to Don Weber and Bob Berninzoni for streamlining custodial service, and gave Jim Brandow high marks for "courteous customer service."

CONSTRUCTION AND YOU

current construction projects affecting parking or vehicular or pedestrian circulation



Bldg 90 Seismic Rehabilitation

A	JUL	AUG	SEP
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Ten spaces N of Bldg 90 will continue to be used by the contractor. Delivery access has been restored to the S end of Bldg 90. Pedestrian access will be rerouted as needed for demolition and buttress/foundation construction, and will be via a covered walkway for the main entrance. Trailers will be evacuated periodically. In late June, about 18 parking spaces near Bldg 90C will be used by the contractor as a staging area.

Bldg 56 Biomedical Isotope Facility

B	JUL	AUG	SEP
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Construction will begin late July. The contractor's laydown area will be located adjacent to Bldg 56. About 8 stack parking spaces will be affected on the N side of Bldg 56.

Bldg 70/70A Site Ventilation Improvements

C	JUL	AUG	SEP
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Parking spaces adjacent to Bldg 70 will continue to be reserved for a laydown area, trailer, surge space, and contractor parking.

Bldg 64 Fire & Safety Upgrades

D	JUL	AUG	SEP
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Construction to provide Fire & Life Safety Upgrades in Bldg 64 is scheduled to begin in July. Parking spaces adjacent to the building will be reserved for construction operations.

Original Labsite Substation

E	JUL	AUG	SEP
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Construction of the substation began in September 1993 and will continue through September 1994. Traffic delays may occur along Road N and Cyclotron Road.

Bldg 77 Ultrahigh Vacuum Cleaning Facility

F	JUL	AUG	SEP
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Construction began in June 1994. The contractor's laydown area will be located near Rm 156, affecting 3-4 parking spaces.

Bldgs 55, 58, 25A, 51B, 74 and 88 Roof Replacement

G	JUL	AUG	SEP
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Reroofing of these buildings will be continued through October. Each building will have contractor staging areas and at times require the evacuation of parking spaces near roof edges while reroofing is being done.

This work will require the use of hot asphalt and it is likely to be smelly, noisy and dusty in and around these buildings. Care will be exercised to minimize disruption of occupant activities in these areas. Please contact Project Manager, Kirk Haley at x5973 with any concerns about this work.

ON THE DRAWING BOARD

projects in study or conceptual design

ELISE

The Elise Project consists of design, procurement and construction of a new heavy ion linear accelerator, ancillary equipment and facilities to house the system. The accelerator will consist of an induction accelerator approximately 25 m long, with induction cells containing about 41 metric tons of magnetic material. Major subsystems are an existing ion injector and an electrostatically focused accelerator section. The accelerator will have an alignment system, high vacuum system, diagnostics, data acquisition and control system, and special maintenance equipment. Facilities design includes modifying and building an insulated steel frame accelerator enclosure in Bldg 51B, and will include an Energy Monitoring and Control

System (EMCS), as well as standard lighting and fire protection systems.

Mechanical Equipment Replacement, Ph II

LBL has about 16,000 separate pieces of mechanical equipment and systems, varying in age up to more than 40 years. A Nov 1991 survey of the conditions of site mechanical equipment was followed by an assessment of deficiencies, comparisons of replacement versus repair costs, evaluation of safety and programmatic importance, and finally selection of candidate equipment items. Phase I replacements will include selected air compressors, boilers, chillers, cooling towers, emergency generators, fans, heat pumps, seismic safety shut-off valves in the natural gas system, unit heaters and water pumps.

IN PROGRESS

funded projects

Bldg 64 Renovation

Design is in progress for this project to provide about 880 NSM of the two story portion of Bldg 64 for the Genome Sequencing Projection facility. The new facility will consist of about 600 sq m of sequencing production laboratory and equipment support space and 280 sq m of office and employee support space.

Bldg 2 Nanofabrication Laboratory

Design is in progress for conversion of the first floor NW quadrant of Bldg 2 into a cleanroom laboratory suite to support research programs at the LBL Center for X-ray Optics (CXRO). The facility will house a "nanowriter", an advanced e-beam writing tool for fabrication of x-ray masks, nano-structures, and x-ray zone plates.

Bldgs 77/77A Energy Conservation Upgrades

A complete EMCS system will be installed, with variable frequency drives for chilled water pumps, tower water pumps, heating water pumps, and cooling tower fan, a flat plate heat exchanger for tower water cooling of chilled water, and a side stream filtration system for cooling tower water. Work included will be as for the Bldg 50 complex. Payback in energy savings on \$400K is anticipated to be less than 10 years.

Bldg 50 Complex Building Automation and Lighting Occupancy Sensor Project

A complete EMCS and lighting occupancy sensor system will be installed to control building heating, cooling and lighting systems during non-occupied hours. All building systems will be EMCS controlled including: chillers, boilers, supply/exhaust fans, and zone heating/cooling control valves. Work includes all new

equipment, EMCS controls, LAN loop connections, system programming, start-up, testing, and training. Payback in energy savings on initial \$1.7M investment is anticipated to be less than 5 years.

Bldg 72 Addition

Design is in progress for an addition to the north side of Bldg 72C, providing more space for the Material Science Division's National Center for Electron Microscopy. A total area of about 285 GSM will include three electron microscope laboratories on the first floor and ten supporting offices on the second floor.

Bldg 85, Hazardous Waste Handling Facility

Construction is pending for the Hazardous Waste Handling Facility. Located in the Life Sciences Research Area, the new facility will consolidate existing waste handling activities in one location. Completion is expected in spring of 1996.

Site-Wide Building Automation

LBL's distributed EMCS will be expanded. This system provides central monitoring and control for the conservation of space conditioning energy. Work includes all EMCS controls, LAN loop connections, system programming, start-up, testing, and training. Buildings included: 31, 31A, 42, 55A, 62A, 64, 69, 71, 71B, B-71K, 73, 75B, 75E, 77G, 78,79, and 88.

Human Genome Lab

The 3800 sq m, 3-story Human Genome Laboratory near the Biomedical Lab (Bldg 74), and the Cell Culture Lab (Bldg 83). This state of the art molecular genetics research facility will contain open laboratory areas furnished with modular wet benches and desks. Support facilities will include cold rooms, dark rooms, cell tissue rooms, autoclaves and laboratories for robotics, instrumentation and computation. Completion is scheduled for late 1997.

PROJECTS

SURPLUS FACILITIES

continued from page 1

SFIA information will be used by DOE to plan and budget for surplus facilities, identifying those that can be readily transferred to the private sector as well as contaminated facilities that must be managed until eventual transfer to DOE's Office of Environmental Restoration and Waste Management (EM) for decommissioning, decontamination and final disposition, including possible reuse. 1,200 DOE facilities were identified as surplus and contaminated, and 60 of these were designated high-ranking in priority for transfer to EM, including the Bevalac.

Bevalac Decommissioning and Decontamination (D&D). From 1954-1972, Bldg 51 was operated as the Bevatron for High Energy Physics,

aided the discovery of the anti-proton and anti-neutron, and was associated with several Nobel prizes. From 1973-1993, the Bevatron was operated in conjunction with the Bldg 71 SuperHILAC Injector as the Bevalac, when it was used by Nuclear Physics for relativistic heavy ion research, cosmic ray studies and by biomedical groups for heavy ion biology studies and patient treatment. Since deactivation in 1993, activities for securing the Bevalac and preparing for transfer to EM, funded by \$10M from DOE, have included redistributing utilities, personnel retraining and transfer, and hazmat cleanup.

Acceptance of the Bevalac by EM is under review and would occur in FY96 at the earliest. However, the Bevalac is in competition for resources with the other high-ranking facilities, including

contaminated nuclear facilities. Other alternatives are under consideration. 80% of the D&D cost is for disposal of contaminated materials, including 12,950 tons of concrete shielding blocks and 6,800 tons of steel and copper. Shielding block radioactive activation levels are so low—typically 10's of $\mu\text{rad/hr}$ or less—that they pose no health hazard, but disposal regulations would require burial at Hanford, estimated at \$103M. Reducing this major cost to a fraction of that for disposal, one proposal is to relocate the shielding blocks to Brookhaven National Laboratory for reuse by the Relativistic Heavy Ion Collider facility. This would also save BNL the cost of construction and ultimate disposal of new shielding. Bldg 51 is planned for use for accelerator facilities, making good use of existing support utilities and infrastructure.

ESTIMATING PROCESS STREAMLINED

The Facilities job estimating process is being restructured to improve efficiency and service in the following respects:

- Reducing estimating time and cost for the client
- Standardize estimates format with full line-item detail by activity, clarifying costs and improving consistency
- Develop historical cost data to improve tailoring of estimates for LBL

This will not affect the work request process.

Reorganized structure. Previously, estimating was divided between A&E estimator John Eastman and the M&O Planning and Estimating group, headed by Wesley Steele. To improve communication and coordination, a

unified Facilities estimating group has been formed, under John Eastman. Eastman, who has been at LBL for a year, has 25 years of experience in construction estimating and construction management and a degree in mechanical engineering.

As before the reorganization, Eastman will continue to focus on large job estimating, usually over \$25K, such as new building construction or major modifications, which require A&E design input and will be performed by general contractors. Also as before, the M&O group will handle small job estimating and planning of jobs to be performed by M&O. In addition to job details and craft coordination, job planning includes field checking and analysis for hazards

such as asbestos and lead, which can substantially change job requirements.

Standardized estimating. Previously M&O estimating was performed by each craft involved in a job. Under the new system, selected M&O estimators will be trained in all-craft estimating by a consulting senior estimator and will attend estimating classes. All craft estimating will reduce the number of people involved and coordination time, reducing the time and cost of estimating.

The standardized format will include full line-item detail for each activity, clarifying charge breakdowns for clients and improving cost monitoring. This uniform approach should also improve estimate consistency, and help in developing historical cost data, which will improve cost prediction and tailoring of estimates for LBL.

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