

The official
publication of APPA:
The Association of
Higher Education
Facilities Officers

Facilities Manager

Volume 8 Number 3

Summer 1992



TOTAL
QUALITY
MANAGEMENT
for Campus Facilities

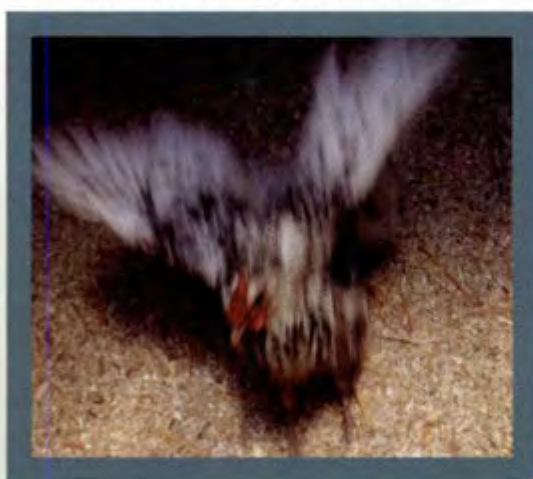
CONSTRUCTION

THE OLD WAY

What You Pay



What You Get



THE DOC WAY

What You Pay



What You Get



Have you got what it takes for the DOC Pilot Program? Surprise Yourself. Take a Test Flight. We'll earn your respect while you earn your wings.

CALL

1.800.962.1604



MCC CONSTRUCTION CORPORATION / DOC PILOT PROGRAM
50 SCHOOLS 50 STATES 50 WEEKS



Total Quality Management for Campus Facilities

by Gary L. Reynolds

14

Cover illustration by David Whitmore

FEATURES

22 Continuity and Contradiction in Contemporary Campus Architecture

by Werner K. Sensbach



28 Residential Facilities Maintenance: A University Housing Perspective

by Floyd B. Hoelting and David A. Cain

34 Reorganizing For Zone Management

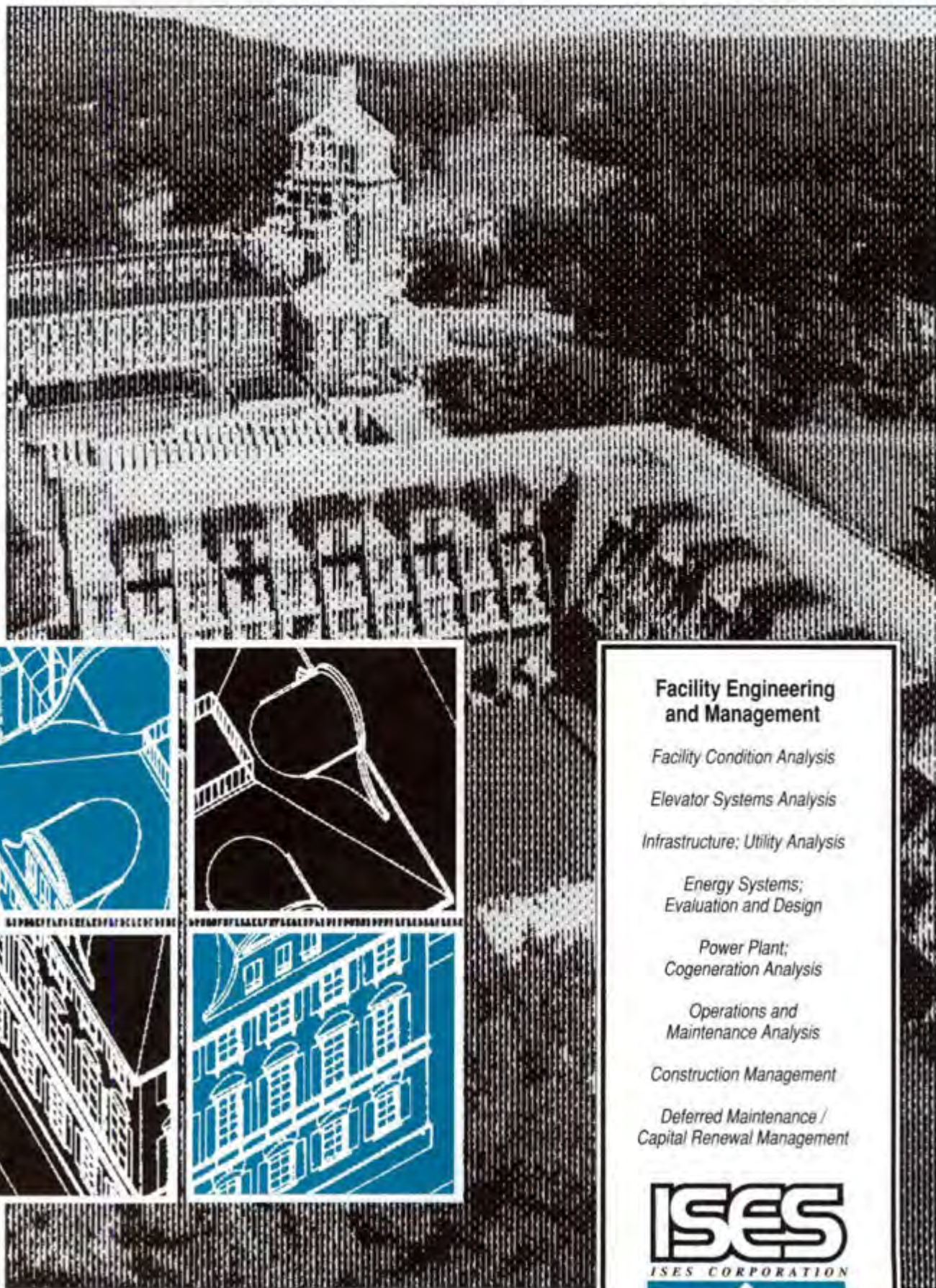
by Kenneth A. Hall

DEPARTMENTS

APPA News	3
• A Leader Emerges	
• Higher Ed Cooperates on Self-Operations Study	
The Environment	7
by Stephanie Gretchen	
Capital Notes	8
by Donna Wiesner	
Focus on Management	10
by Sigmund G. Ginsburg	
Perspective	13
by Sharon L. Cramer	
APPA Answers	40
by Maxine Mauldin	

Global Exchange	41
by Noppadon Muangkroot	
Data Base Update	43
by Howard Millman	
The Bookshelf	45
Reviewed in this issue:	
• Budgeting of Higher Education at the State Level	
• Fundamentals of Noise Control Engineering	
• Indoor Air Quality: Design Guide Book	
• Cogeneration and Small Power Production Manual	
• Planning and Managing Higher Education Facilities	
Job Corner	48
Coming Events	50
Index of Advertisers	50

engineered solutions



**Facility Engineering
and Management**

Facility Condition Analysis

Elevator Systems Analysis

Infrastructure: Utility Analysis

*Energy Systems;
Evaluation and Design*

*Power Plant;
Cogeneration Analysis*

*Operations and
Maintenance Analysis*

Construction Management

*Deferred Maintenance /
Capital Renewal Management*



**Intelligent Systems &
Engineering Services**

Lake Lucerne Office Park / Suite 1A / 4615 Highway 78 / Lilburn, Georgia 30247
Telephone: (404) 985-8651 / Facsimile: (404) 985-6327

APPA News

A LEADER EMERGES: Harvard Sets an Example for Financial Reporting on Facilities as a Capital Asset

by Walter A. Schaw
APPA Executive Vice President

For several years, there have been some heated debates and much discussion in higher education about the depreciation of facilities as a capital asset. In 1990, the Financial Accounting Standards Board ruled that future financial reports of private colleges and universities would include statements of facilities as a capital asset, typically at historic cost less the cost of depreciation to a plant fund. Operating funds were not necessarily affected. When Harvard University recently revised its financial statement by calculating depreciation on replacement rather than historic cost then applied that cost as an operating expenditure, it became an exception to common practice and gained national attention.

Harvard's decision to depreciate at replacement cost over thirty-five years caused an increase in depreciation to \$76.5 million in 1991, from the historic cost base of \$37 million in 1990. The application of this cost to operating expense created a deficit of \$41.9 million instead of a modest surplus (Harvard's first deficit since 1974). It should be noted that this cost is in addition to normal maintenance and a planned program to reduce deferred maintenance. Replacement cost as a basis for depreciation will be adjusted annually to reflect local construction costs for particular types of buildings such as classrooms, laboratories, housing, and libraries.

A principal objective of Harvard in

revising its financial statement was given: "To reflect information about Harvard's facilities in a meaningful and complete fashion." The changes were influenced by a survey of internal and external users. In reporting the results of the survey, it was noted that "virtually everyone wanted to know why Harvard does not capitalize facilities."

Their revisions applied the "facilities equilibrium" theory, which has been advanced and articulated by APPA, National Association of College and University Business Officers (NACUBO), Society for College and University Planning (SCUP), and Coopers & Lybrand. That theory, designed to preserve the value of facilities as a capital asset, recognizes an annual wear-down of facilities capital as a real cost. Failure to recognize that cost (or fund it) has been regarded as a principal cause of the

significant backlog of accumulated capital renewal/deferred maintenance in higher education. This backlog has been established at more than \$60 billion in the 1989 research report *The Decaying American Campus: A Ticking Time Bomb*.

As noted in the foreword of Harvard University's financial report by D. Ronald Daniel, treasurer, and Robert H. Scott, vice president for finance, if depreciation had been based on historic cost instead of replacement value, the university would have reported a small surplus. "Such a 'surplus,'" they stated, "would fail to record the costs we

must incur indefinitely to maintain our facilities in good condition. Harvard is determined to balance its budget with the real costs of facility renewal included, thus assuring that sufficient funds are provided regularly for this important priority."

Harvard's financial planning for facilities took a major turn in 1986 when a planning group quantified the institution's deferred maintenance liability. Since then, nearly \$500 million has been spent to reduce backlogs in a five-year capital expenditures plan and, at minimum, maintain facilities in their current condition. The planning group worked closely with Harvard's faculties on strategies to both identify and address major renewal needs.

The university's 1990-91 financial report also indicated potential problems, given the traditional independence of Harvard's schools: "Recent budget constraints, however, suggest that Harvard's goal to reduce or hold steady its deferred maintenance may be especially difficult to achieve in the current economic environment. Several schools are not currently planning to invest adequately in their facilities over the next two years." Harvard facilities comprise some 16.7 million square feet and have an estimated replacement value of \$3.5 billion.

In discussing the revisions with Harvard financial planning and budget officers, they suggested that a third element of a triad is needed. The element to be added to existing strategies for endowment and physical capital is the recognition of and investment in human capital on an equally consistent basis to ensure the long-term goals of excellence in higher education.



Schaw

APPA STAFF

Walter A. Schaw, CAE
Executive Vice President

Wayne E. Leroy, CAE
Associate Vice President

Cotrenia Aytch
Publication Sales Coordinator

Chong-Hie Choi
Controller

Theresa Cooper
Assistant Director of Educational Programs

Celia Feldpausch
Administrative Assistant

Melissa Gingery
Receptionist/Staff Assistant

Steve Glazner
Director of Communications

Stephanie Gretchen
Communications Manager

Maxine Mauldin
Information Services Manager

Tina Myers
Office Manager

Fran Pflieger
Book Editor

Fritz Saint-Leger
Accounting Assistant

Katherine J. Smith
Director of Educational Programs

Diana L. Tringali
Director of Marketing

Donna Wiesner
Director of Government Relations

Higher Ed Associations Cooperate on Privatization/Self-Operations Study



Seated, from left: Jane Ryland of CAUSE; Walter Schaw of APPA; Debra Rodeffer of NACUBO; and Gary Schwarmueller of ACUHO-I. Standing, from left: Dick Creal of CUPA; Neil Markee of NAEB; Stan Clark of NACAS; David Hollowell of SCUP; Ron Inlow of NACUFS; and Charles Thodt of NACS.

When the Council of Higher Education Management Associations (CHEMA) decided that there was a need for an unbiased guide for colleges and universities to evaluate options for self-operation and contract management, member associations elected to produce such a book themselves.

CHEMA's concern was that many institutions, caught between unwanted further increases in tuition and fast-rising institutional costs, are reevaluating "business as usual." A task force was formed to study what could be done to help institutions, and it recommended producing the study as a way of pooling association resources.

CHEMA members represent campus managers from twenty-eight different administrative areas, thus ensuring that the study will have a wide focus, applicability across the campus, and an unbiased approach to assessing activi-

ties and available options.

The project will attempt to identify less-recognized factors and will go beyond financial impact to include evaluation of those non-quantifiable changes in the campus environment that any decision might entail. Physical plant, telecommunications, food services, residence halls, security, and bookstores will all be considered in the study. Results of a survey of institutions and various constituencies will be used in assessing past experience and current expectations in relation to contract management and self-operation.

APPA is one of the twelve higher education associations providing funding for the project. Walter Schaw, APPA executive vice president, is a member of the project's task force.

The publication is being researched by Coopers & Lybrand and is scheduled to be published by the end of 1992.

Facilities Manager (ISSN 0882-7249) is published quarterly (Winter, Spring, Summer, Fall) by APPA: The Association of Higher Education Facilities Officers, 1446 Duke Street, Alexandria, Virginia 22314-3492. Editorial contributions are welcome and should be sent to this address.

Of APPA's annual membership dues, \$30 pays for the subscription to *Facilities Manager* and *APPA Newsletter*. Additional annual subscriptions for both periodicals cost \$40 (\$50 for non U.S. addresses). For information on rates and deadlines for display and classified advertising, telephone 703/684-1446.

Copyright © 1992 by APPA: The Association of Higher Education Facilities Officers. Contents may not be reprinted or reproduced in any form without written permission. The opinions expressed are those of the authors and do not necessarily reflect the views of APPA. Editorial mention of companies or products is for informational purposes only and should not be construed as an endorsement, actual or implied, by the Association.

POSTMASTER: Send address changes to **FACILITIES MANAGER**, 1446 Duke Street, Alexandria, VA 22314-3492.

1991-92 APPA Executive Committee

President, Joe J. Estill

Texas A & M University

President-Elect, Donald L. Mackel

University of New Mexico

Immediate Past President, William D. Middleton

University of Virginia

VP Educational Programs, E. Diane Kerby

Berea College

VP Information Services, Jon M. Gillette

Vanderbilt University

VP Membership, George T. Preston

Art Institute of Chicago

VP Professional Affairs, Charles W. Jenkins

St. Mary's University

Secretary, Howard A. Wells Jr.

Pennsylvania State System of Higher Education

Treasurer, William J. Sharp

Decision University

Board Representative, E. Dudley Howe

Stetson University

Executive Vice President (ex-officio)

Walter A. Schaw

Editor, Steve Glazner

Associate Editor, Stephanie Gretchen

Advertising, Diana L. Tringali

Subscriptions, Cotrenia Aytch

Art Direction/Typography, Chronicle Type

& Design

Printing, Good Printers

Editorial Office, 703/684-1446

Fax, 703/549-2772

Bitnet, APPA@BITNIC.BITNET

Facilities Promote Math and Science

Ten months after releasing its model for effective reforms of undergraduate math and science, Project Kaleidoscope has published its second volume, offering resources to support key parts of the reform outlined in its original report.

In volume II, *What Works: Resources for Reform*, the National Science Foundation-funded panel of educators focuses on three types of resources for those working toward reform:

- **Facilities:** a series of essays and architectural illustrations that explore issues of design, planning, and financing construction and renovation projects.
- **Research:** an analysis and interpretation of national data—disaggregated for the first time by field, race, gender, institution, and institutional type—that describe the institutional productivity of baccalaureates in math and science and the baccalaureate origins of doctorates in these disciplines.

• **Bibliography:** a list of books and reports that focus on institutional and curricular reform, minorities in science, women in science, research and data, faculty development, and the K-16 educational continuum.

What Works: Resources for Reform costs \$20. Volume I, *What Works: Building Natural Science Communities*, costs \$19. For more information, contact Project Kaleidoscope, c/o The Independent Colleges Office, Suite 1205, 1730 Rhode Island Avenue, N.W., Washington, DC 20036; 202/232-1300.

College's Eco-Design

The College of William and Mary is building a university center with the environment in mind. The state-funded project will be constructed in accordance with the guidelines of the Virginia Chesapeake Bay Preservation Act, the Erosion and Sediment Control Act, and the Storm Water Management Act.

Christenson Wins Rex Dillow Award



James E. Christenson, director of plant operations at University of Michigan, is the recipient of the sixth annual Rex Dillow Award for Outstanding Article in *Facilities Manager*. The award will be given at the 79th Annual Meeting in Indianapolis, Indiana.

Christenson wrote "Maintenance Management for the 1990s," which appeared in the Spring 1991 *Facilities Manager*. The article was selected by APPA's Professional Affairs Committee from among seven eligible articles. Only articles written by full-time staff members at APPA member institutions are eligible for the award.

Christenson's article is being reprinted in the forthcoming *Operations and Maintenance*, the eighth title in APPA's Critical Issues in Facilities Management series.

The Rex Dillow Award was named for member emeritus Rex O. Dillow who has made valuable contributions to APPA publications. Dillow was editor-in-chief of APPA's two editions of *Facilities Management: A Manual for Plant Administration*. He is also newsletter editor for APPA's Central region, and he received APPA's Meritorious Service Award in 1983 and the President's Award in 1989.

Previous Rex Dillow Award recipients have included the following:

- 1987—Douglas K. Christensen, "Integrating Capital Studies Within Physical Plant Operations," reprinted in *Capital Renewal and Deferred Maintenance*.
- 1988—Harvey H. Kaiser, "Capital Needs in Higher Education," reprinted in *Capital Renewal and Deferred Maintenance*.
- 1989—William S. Mutch, "The 1988 Olympic Winter Games: The University of Calgary Involvement."
- 1990—Teresa S. Hargett and Robert C. Osborn, "Cornell Recycles: A Major University Commitment," reprinted in *Case Studies in Environmental Health and Safety*.
- 1991—Paul Banks and Carolyn Harris, "The Library Environment and the Preservation of Library Materials," reprinted in *Preservation of Library and Archival Materials*.

REQUIRED READING FOR THIS YEAR'S CURRICULUM...

Case Studies in Environmental Health and Safety



Learn how facilities managers at 16 colleges and universities have minimized their liabilities working within the current restrictive environmental codes. Topics include: hazardous waste management, USTs, recycling, sick buildings, asbestos abatement, medical waste, and PCBs.

APPA member	Nonmember
\$25.00	\$35.00

Shipping/Handling: All U.S. orders add \$8, all international orders add 20% of subtotal (\$10 minimum s/h charge).

All orders must be accompanied by a check. All international orders must be prepaid in U.S. funds. Allow 3-4 weeks for delivery.

Send orders to:
APPA Publications, Dept. CS
P.O. Box 1201
Alexandria, VA 22311



The Association of
Higher Education Facilities
Officers

Information Request

Ursinus College would like to put together a compendium of **safety policies** from colleges and universities in the United States. If you have a safety program for all OSHA-related issues, please contact Fred Klee, Ursinus College, Main Street, Collegeville, PA 19426-1000; 215/489-4111 ext. 2247.

ADA Assistance

The Hickman Signorelli Group has made available *ADA Signage Solutions*. This booklet describes ADA and helps the reader develop a plan for signage compliance. The author, Fred Knowles, is president and founder of Architectural Graphics. This booklet is free. For more information, contact The Hickman Signorelli Group, 3007 West Clay Street, Richmond, VA 23230; 804/358-1512.

Find out how to keep sports lighting simple and trouble-free . . . year after year.

Send for your free guide to Musco's Light-Structure System™

Take the worry out of sports lighting. Factory-engineered in five basic modules, Light-Structure is a total system—from foundation to pole top. Built-in features assure you of:

Fast, easy installation . . .

- Precast concrete foundation for direct burial;
- Galvanized steel pole with fast slip-fit construction;
- Pole-top luminaire assembly with welded crossarms and guaranteed-accurate factory alignment.

Responsible, energy-efficient lighting . . .

- Innovative fixture design produces 25% more light for every kilowatt of energy you use;
- Patented reflector design reduces wasted spill and glare light by as much as 95%.

Trouble-free operation . . .

- Electrical enclosure on pole 10' above ground is easy to service from stepladder;
- Enclosed wiring prevents wind and weather damage;
- Corrosion protection for all exposed metals.

Plus the extra safety assurance of UL listing and CSA approval for the total system—from foundation to pole top. And Musco's assurance of reliable, trouble-free performance with an unprecedented seven-year warranty—from foundation to pole top.

For your free Light-Structure System brochure, visit booth #210 at the Association of Physical Plant Administrators Conference, July 26-29 in Indianapolis, Indiana, or

call: **1-800/825-6030**
or write: Musco Sports-Lighting, Inc.
P.O. Box 808
Oskaloosa, Iowa 52577



Light-Years Ahead . . . Through Technology

ADAP2

The American Association for the Advancement of Science (AAAS) is also offering help to those interested in ADA. AAAS works to improve advancement in science, mathematics, and engineering for people with disabilities. AAAS has published *Laboratories and Classrooms in Science and Engineering*, a guide for educational institutions. For more information, contact AAAS, Directorate for Education and Human Resources Programs, Project on Science, Technology, and Disability, 1333 H Street, N.W., Washington, DC 20005; 202/326-6630.

The Justice Department, the American Foundation for the Blind, and Gallaudet University's National Center for Law and Deafness are working together to provide free ADA information. The services offer legal advice and technical assistance on ADA. The American Foundation for the Blind's number is 202/223-0101. The National Center for Law and Deafness can be reached at 202/651-5343. The Architectural and Transportation Barriers Compliance Board, which also offers ADA assistance, can be reached at 800/USA-ABLE.

APPA is also offering assistance through its book, *Removing the Barriers: Accessibility Guidelines and Specifications*. The publication includes information on site accessibility, building entrances, doors, interior circulation, bathrooms, drinking fountains, telephones, special spaces, facilities inventory and evaluation, achieving accessibility, and additional resources. *Removing the Barriers* is 127 pages, with 105 illustrations. The book costs \$45 for APPA members, \$55 for all others; add \$8 for shipping and handling. Send checks to APPA Publications, Dept. RBNL, P.O. Box 1201, Alexandria, VA 22313. Prepayment is required.

Universities Win Cogen Grants

Martin Marietta Energy Systems, Inc. invited municipalities, companies, and institutions to respond to a request for proposals to assist district heating and/or cooling systems with innovative or unique situations to convert to cogeneration. The Department of Energy gave \$400,000 for matching-fund grants for this project. Eleven proposals were submitted; six were from universities. Of the three proposals chosen, two were from higher education: Catholic University (DC) and University of Alabama.

The Environment

Stephanie Gretchen

There are new technologies available, besides incineration, being used for the disposal of **biomedical wastes**. Kathy D. Loving, of the National Solid Waste Management Association, said at a solid waste conference May 5 that although incineration still dominates the market, technologies such as steam sterilization, microwave disinfection, chemical disinfection, and electrothermal deactivation are also being used. She also said that trends in the market over the next several years will include reduction in on-site incinerators, increased use of non-incineration technology, industry consolidation, and a leveling out of supply versus demand.

Public concern has been steadily rising about the effects on the environment from heavy metals in **batteries**. According to *Pollution Prevention News* March-April issue, batteries without toxic heavy metals, such as mercury and cadmium, will be available this year. Some of the companies that produce these batteries are Harding Energy Systems, Battery Technologies Inc., and Matsushita Battery Industrial Company allied with Rayovac and Panasonic.

Anyone interested in **improving air quality and lowering energy consumption** may want to get a copy of *Cooling Our Communities: A Guidebook on Tree Planting and Light-Colored Surfacing*. The booklet describes landscaping and color-lightening strategies that have economic and environmental benefits. For more information on this \$13 book, contact Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-

Stephanie Gretchen is APPA's communications manager and associate editor of Facilities Manager.

7954) or call Steve Winnett at 202/260-6923.

World Resources Institute publishes a number of books on data bases; biological diversity and agriculture; business, economics, and technology; **energy, transportation, and global warming**; global management and development; and the environment. A *New Power Base: Renewable Energy Policies for the Nineties and Beyond* is one of its books. For more information, contact Publications Department, World Resources Institute, 1709 New York Avenue, N.W., Washington, DC 20006; 800/822-0504.



IAQ Publications, Inc. has published *Indoor Air Quality Directory*. This book is 375 pages, costs \$75, and documents the **indoor air quality** industry. For more information, contact IAQ Publications, Inc., 4520 East-West Highway, #610, Bethesda, MD 20814; 301/913-0115.

BNA has published *Waste Management Guide: Laws, Issues and Solutions*, a 440-page book that covers reducing **hazardous and nonhazardous waste**, disposing of remaining waste, meeting federal and state requirements, and maintaining a positive relationship with your community. This publication costs \$52. For more information, contact BNA Books Distribution Center, 300 Raritan Center Parkway, P.O. Box 7816, Edison, NJ 08818-7816; 800/372-1033.

The EPA proposed, in the May 20 *Federal Register*, two new ways to exempt some low-risk wastes from federal **hazardous waste** controls under RCRA. One alternative would identify concentration-based exemption criteria for listed hazardous wastes, waste mixtures, derivatives, and media contaminated with certain listed wastes. The second alternative would be based upon "characteristic" levels for listed hazardous wastes, waste mixtures, derivatives, and media contaminated

with certain listed wastes. For more information, contact the RCRA Hotline at 800/424-9346, or for technical information, William A. Collins Jr., Office of Solid Waste (OS-333), U.S. EPA, 401 M Street, S.W., Washington, DC 20460; 202/260-4791.

On May 3, the Senate Environment and Public Works Committee approved an amendment of RCRA that would give states the authority to ban **out-of-state waste shipments** if the affected local government and any affected local solid waste planning unit requests a ban. Bans could not breach any existing contracts between local governments and a landfill or incinerator.

In EPA's final rule on **used oil**, it decided not to list used oils as hazardous waste because not all used oils meet the technical criteria for listing a waste as hazardous. According to the May 20 *Federal Register*, this rule "preserves the status quo" for used oil. This ruling was effective June 19, 1992. The agency will "in the near future" decide whether to list used oil that is going to be recycled as hazardous.

This Is How Long Our EXIT LAMP Lasts. . .

130,000
Hours

As Compared To:

PL T-6X
10,000 HRS. 2,500 HRS.



9 Watts



11 Watts



20/25 Watts

ETERNALAMP is a state-of-the-art lamp specifically designed for **exit** fixtures.

Features include:

- 15 Year Life Expectancy
- Guaranteed for 2 Years
- Unbreakable
- No Rewiring Required
- Meets Lighting Codes

ETERNALAMP manufactured in the USA by:

STANDARD ENTERPRISES, INC.
14849 Build America Dr., Woodbridge, VA 22191
1-800-296-EXIT

Phone 703-490-3300 FAX 703-407-2310

Capital Notes

Donna Wiesner

Virginia's Board of Housing and Community Development adopted the amended version of the Uniform Building Code (UBC) that had incorporated ADA requirements for alterations and new construction. The Building Owners and Managers Association International and others are concerned that building officials will now be interpreting provisions in ways that may not match federal or court interpretations.

Virginia will have a referendum on higher education facilities bond issues on the November ballot. Plus, the state legislature became more Republican in the 1991 election, and passed legislation to elect school board members. Virginia is one of two states with appointed, not elected, elementary and secondary school board members. This may not be on the ballot until 1994, but several organizations are building support to get the issue voted up or down this November.



Florida's budget debate may have far-reaching consequences for your institution's revenue and for APPA meetings in the state. Governor Chiles of Florida campaigned as a budget cutter. Last year he cut the state budget by \$2 billion, but is proposing \$1.5 billion in tax increases to balance the budget this year. Florida's constitution requires balanced budget by July 1. The governor's "Fair Share" budget includes a state

Donna Wiesner is APPA's director of government relations.

sales tax on services, including admission charges by nonprofit organizations under 5501(c)(3); admission charges to cultural events sponsored by tax-exempt organizations; and convention, conference, seminar, and meeting registration fees.

On March 20, a federal district court in California ruled that employees were "hourly/non-exempt" not "salaried/exempt" because absences from work were subject to prorated or hourly deductions in pay. The recent interim final regulation by the Department of Labor that allowed this practice was struck down. This may have far-reaching consequences for all employers.

Reauthorization of the Higher Education Act may change the way College



Construction Loan Insurance Association (Part B Senate; Part E House) (Connie Lee) functions.

A provision in Sec. 705 of the House bill for HEA would improve the ability of institutions to obtain long-term financing for academic facilities projects. The House bill would amend Sec. 752(c)(1) to allow Connie Lee to insure colleges that have been rejected for insurance by other insurance companies, even if the institution has an average or better credit rating. At present, Connie Lee is limited in its ability to help such schools, even though they could have been denied insurance due to unattractive geographic location, lack of name recognition, a complex financing structure, or other reason. The Senate bill does not contain this language. The House bill H.R. 3553 changes the Stu-

dent Loan Marketing Association (Salie Mae) in a similar fashion.

EPA is proposing to allow waste that poses little or no risk to public health (a variation on mixed with and derived from) to be exempt from the RCRA stringent record keeping and disposal requirements. This would occur in one of two ways: change the way toxic wastes are defined, or use the hazardous waste identification rule and exempt the substance as its hazardous waste threshold gets weakened. President Bush will come closer to the views of the Council on Competitiveness (headed by Vice President Quayle) than to EPA's.

The President has also sided with facilities rather than the EPA on Clean Air regulations that would have required a forty-five-day review process and public comment period before permitting to increase emissions. In April 1991, the administration proposed that industry increase emissions with seven day advance notice to state authority.

I have reported that the United States has not agreed to sign the treaty agreeing to stabilize carbon dioxide emissions to 1990 levels by the year 2000. Now a White House study, "U.S. Views on Global Climate Change," reports that reaching this goal may be possible without many expensive new controls. Environmental groups are using this data to pressure the Bush Administration into signing the agreement. Be watchful of the international environmental conference in Rio; the contingent of Americans is large and there may be surprises.

The White House Office of Science and Technology Policy is looking at requiring agencies to change their risk analysis from worst-case analysis to "most probable" risk to human life. Then the Office of Management and Budget informed the Department of Labor that because regulations force employers to cut employment or



wages, and because higher paid workers take better care of themselves, then less protection may save lives. This kind of rethinking may change the substitutes for chemicals like CFCs, for example. No CFC substitutes will be commercially available anytime soon since

many are costly, flammable, caustic, or cause tumors in rats.

Walter Simpson, energy officer at the State University of New York, kindly analyzed some resources put out by the Office of Federal Energy Management Programs (FEMP) of the Department of Energy. Energy managers may want to look at the *Architect's and Engineer's Guide to Energy Conservation in Existing Buildings* (Volumes I and II) and A Simplified Energy Analysis Method (ASEAM) software. The book explains how to assess energy saving opportunities for existing buildings and discusses 118 energy conservation methods and how savings for each can be calculated. The list is inclusive except for passive solar and high performance glass. ASEAM version 3.0 simulates building energy use for heating, cooling, lighting, and equipment using the ASHRAE bin methodology, both for new construction and retrofit applications. This program can serve as a useful tool for projecting savings from energy conservation measures. Items are free to energy managers, and APPA is willing to duplicate the discs (about eight total) for our cost, about \$40. If you are inter-

ested, please fax your request with address to me. If you have specific questions on the software, contact Kelly McNulty, Advanced Sciences, Inc., 2000 North 15th Street, Suite 407, Arlington, VA 22201, or call 703/243-4900, or Dean Devine at the Department of Energy at 202/586-6784.

Time is flying, and the Low-Level Radioactive Waste Policy Act of 1980 milestone deadlines are looming. Three

states operating facilities can deny waste generators after January 1, 1993. Not all states have come up with solutions to the new ownership and possession of wastes generated within their borders, and some institutions have been forced to build interim storage facilities. After January 1, 1996, the states must take ownership and possession of wastes at the waste generators' request. ■

DISPOSING OF FLUORESCENT LIGHT BALLASTS?

Recycle with FulCircle!

- Eliminate potential Superfund liability associated with landfilling your PCB ballasts.
- Save 30% off the cost of whole ballast incineration.

FulCircle's recycling solution safely segregates and incinerates all PCBs, and recovers 90% of the ballast material for recycling. It's the environmentally responsible solution to one of your toughest disposal problems.

Call for your FREE copy of the 15-page "Practical Guide to Ballast Disposal" 617-876-2229 Fax 617-876-6655



FulCircle
Ballast
Recyclers

168 Brattle Street Cambridge MA 02138
617-876-2229



Set of 5 Volumes: \$350
Each: \$85

Why re-invent the wheel when it's already been done for you!

Over the years the Physical Plant Department at Virginia Tech has developed a unique series of contract documents which have helped procure high quality and cost effective construction, services, and materials critical to the care, maintenance, repair, and renovation of the university.

These complete contracts are now available in a spiral bound format for adaptation and use by the Physical Plants of other colleges and universities.

Available both individually or as a set:

- **Grounds Services Contracts** (includes Excavating, Mowing, Trash Disposal, Dining Hall Garbage Disposal, and Moving Services)
- **Equipment Maintenance Contracts** (includes Elevator Maintenance, Elevator Inspection, Furnace and Boiler Maintenance, HVAC&R Maintenance, Mechanical Services, and Electrical Services)
- **Building Services Contracts** (includes Custodial Services, Pest Control, Carpet Cleaning, and Window Cleaning)
- **Construction Services Contracts** (includes Concrete, Masonry, Carpentry, Drywall, Ceiling Tile, and Floor Tile)
- **Materials Procurement Contracts** (includes General Building Materials & Hardware, Plumbing & Heating, Electrical, Ready-Mix Concrete, Crushed Stone, and Masonry Supplies)

These contract documents are *complete!* They include the technical specifications, terms and conditions, contractor qualifications, personnel requirements, quality of materials, and standards of workmanship as required for each contract.

FOR ADDITIONAL INFORMATION OR TO ORDER:
Physical Plant Publications, 64 Maintenance Bldg.,
Virginia Tech, Blacksburg, VA 24061.

(703)231-7536

Focus on Management

Sigmund G. Ginsburg

WORKING WITH A DIFFICULT PERSON

Unfortunately, there's no guarantee that your boss, colleagues, or subordinates will be good or easy people to work with. All of us hope and expect that our relationships on the job will be at least satisfactory. The more satisfactory they are, the better we feel. Job satisfaction is influenced to an important degree by how comfortable we feel with those with whom we are in frequent contact and indeed, how much or little we like them in their work capacities (their competence, fairness, style) and as individuals (personality and other attributes that make us like or dislike people). Some people stay or leave their positions primarily because of the organizational culture and climate rather than job content, compensation, challenge, or growth opportunities. A critical element in the climate is the quality of their personal and professional relationships. Looking forward to working with individuals and enjoyable lunch times, coffee breaks, and sometimes after-work social contacts can enhance the quality of work life considerably, as well as one's professional and personal life.

The flip side of the coin is working with difficult, disagreeable, or unpleasant people. The issue is how do you deal with such people, assuming it is not an isolated incident or the individual is going through a particularly difficult period in his or her life. In many cases the question becomes, How much are you able to adjust your think-

ing or style? How much can you stand? And there's a difference whether the difficulty is professional—his or her managerial style, competence, integrity—or his or her personal attributes—attitude, harassment, prejudice, etc.

The actions you might consider taking include 1) discuss with the human resources department how you might deal with the problem, 2) talk it through with your supervisor—indicate your concerns, what you can mutually do to improve things, 3) if there are no results you might consider going to your boss' supervisor, but recognize this is a dangerous, last-resort step because it may very well exacerbate the situation with your superior. However, sometimes the higher official can help smooth things out or arrange a transfer, and 4) consider a transfer to another unit of the organization or seek other employment—this assumes that the situation is intolerable and the relationship cannot be improved. You might consider this when the stress and strain could be injurious to your physical or psychological health and your work performance. It is just not worth continuing the relationship because of the possible personal and/or professional impact on you.

For colleagues, the talking-through approach in regard to professional matters is recommended, with intercession, if necessary, by another colleague or your supervisor. If it is someone in another unit, your supervisor may have to get involved. The point to be raised is, "Your approach, position, style is creating a problem for me in accomplishing my work requirements and/or in our work relationship. How can we work together to modify, moderate, change the irritating condition?" The same approach can apply to colleagues on the same level in other units.

If it is the personal rather than work aspect, you should use whatever approach you feel comfortable with in indicating to someone that his or her actions cause you discomfort, dismay, etc., and "How can we work this out?" You may also consider asking the human resources department to provide guidance and assistance or perhaps solicit help from a mutual friend. It may be that it cannot be worked out and you will just have to bear it, but at least you gave it a good try. You may even decide that it is so unlikely that it can be worked out that you will have to bear without mentioning it.

For subordinates, you as the supervisor are in a stronger position. Again the talking-through approach, by you and if necessary with the help of the human resources department, is recommended. Here the approach would be indicating the aspect of the individual's professional approach that is causing a problem and what we can do together to lessen/eliminate the problem. Counseling and/or training may be required and the human resources department can be helpful.

You can follow-up to see that there is improvement and if there is not, and in accordance with your organization's procedures, some disciplinary action might be necessary—warnings, suspension, transfer to another unit, or request for resignation or discharge.

It is more difficult if it is personal style or attributes that are causing the problem. It is difficult if not impossible to change an adult's personality. Further, a perception that the supervisor is attacking the person rather than the individual's work performance can lead to considerable problems.

Here again, you would be wise to seek the human resources department's guidance, but if carefully thought out, you can approach the subordinate. You might say something like, "Joe/Sally, we're all different and have different approaches/style, but I wonder if there's some way you can moderate/change/stop doing X, because it really makes me uncomfortable. It creates difficulties in my being able to deal with it, though I've been trying very hard, etc." Of course, the matter may be so difficult or awkward to discuss or to change that you may have to just bear it as long as you can without discussing it. (Even after discussion and agreement for actions to be taken, it may still continue to exist.)

In essence, dealing with a difficult person requires you to think objectively and unemotionally as to whether the individual is indeed difficult or to what extent you or conditions beyond the individual's control are causing the difficulty. Further, is the situation difficult enough that you need to tackle it head on in the ways suggested above or through some adjustments and rethinking on your part? If indeed it is a real and continuing difficulty, it is important for your own work performance, psychological well-being, and job satisfaction to meet the issue rather than avoid it. ■

Sig Ginsburg is vice president for finance and administration at Barnard College, and lecturer in management systems at Fordham University, both in New York City.

FACILITY MANAGEMENT COMPUTER CONSULTANT

Purchasing or upgrading a computerized maintenance management system? I can help assure that you receive all the timesaving, headache-relieving benefits that a well-designed, practical system will deliver.

Select the per diem services you need: asset cataloging, software assessments, staff sentiment surveys, bid specifications, hardware recommendations, software installation, data base creation, training, or system maintenance.

Please call for details. No obligation, just cost-effective, time-tested solutions that will work for you.

Howard Millman
Data Systems Services
914/271-6883

Unparalleled baseball stadiums.



The trademark of Southern Bleacher.

Baseball stadiums from Southern Bleacher will assure your college of the highest quality and best value in design, engineering, manufacturing and installation. Designs to meet budget and seating capacity requirements include the custom mitered stadium with optional roof, and base line and outfield bleachers. Since 1946 the name Southern Bleacher has stood for unparalleled achievements in permanent grandstands, stadium seating and portable bleachers.

 **Southern BLEACHER
COMPANY**

P.O. Box One, Graham, Texas 76450

Toll Free: 1-800/433-0912 In Texas: 817/549-0723 FAX: 817/549-1365



ENGINEERING AND CONSULTING SERVICES

DESIGNS THAT BRING power to the people

- ✓ Total Power Plant Design
- ✓ Transmission and Distribution
- ✓ Substation Design
- ✓ Environmental Services
- ✓ Cogeneration

SFT, INC.

6629 W. Central Ave. • Toledo, Ohio 43617

Phone: 419/843-8200 • Fax: 419/843-8020



3M CONSTRUCTION MARKETS
 ACCESS INDUSTRIES, INC.
 ADM INTERNATIONAL, INC.
 ADSCO
 ADVANCED CONTROL TECHNOLOGIES
 ADVANCED THERMAL SYSTEMS, INC.
 ALLISON GAS TURBINE
 AMERICAN BUILDING MAINTENANCE CO
 AMERICAN SCHOOL & UNIVERSITY
 AMERICAN THERMAL PRODUCTS
 ANDERSON-SNOW CORPORATION
 APPLIED MANAGEMENT ENGINEERING
 ARCHIBUS, INC.
 AUTOMATED LOGIC CORP
 BEST LOCK CORPORATION
 BETZ ENTEC, INC.
 BLACK & VEATCH
 BLOCKHOUSE CO., INC.
 BLUE RIDGE CARPET MILLS
 BOBRICK WASHROOM EQUIPMENT
 BRAINERD COMPRESSOR INC.
 BROWNING DAY MULLINS DIERDORF
 CERAMIC COOLING TOWER CO
 CHICAGO BRIDGE & IRON COMPANY
 CHOWN HARDWARE & MACHINERY
 CLUB CAR, INC.
 COUNTRY ROADS, INC.
 DECOGARD PRODUCTS, INC.
 DEXTER WATER MANAGEMENT SYSTEM
 DIAGNOSTIC ENGINEERING INC.
 DIEBOLD, INC.
 DOUCET & MAINKA/ELI
 DOW U.S.A.
 DRITHERM, INC.
 DUGMORE & DUNCAN, INC.
 EDUCATION & INSTITUTIONAL COOP SOC
 ENDURA RUBBER FLOORING
 ENERGY CONTROLS, INC.
 ENGINEERING ASSOCIATES, INC.
 ENGINEERING MEASUREMENTS COMPANY
 ENTECH SALES & SERVICE, INC.
 EXETER ARCHITECTURAL PRODUCTS
 FIBREWORKS CORPORATION
 FULCIRCLE BALLAST RECYCLERS
 GAMETIME, INC.
 GARAVENTA
 GENIE INDUSTRIES
 GRAINGER
 GRAPHICS PLUS, INC.
 HAYES LARGE ARCHITECTS
 HESCO, INC.
 HILLYARD, INC.
 HINGER-IT CORPORATION
 HOECHST CELANESE CORP
 HOK SPORTS FACILITIES GROUP
 HONEYWELL
 HOST/RACINE INDUSTRIES
 HTX INTERNATIONAL, INC.
 HUNTINGTON LABORATORIES, INC.
 IHM SYSTEMS
 INTERKAL, INC.



ISES CORPORATION
 ISOLATEK INTERNATIONAL
 JOHNSON CONTROLS, INC.
 KENALL
 KULLMAN INDUSTRIES, INC.
 LANDSCAPE FORMS, INC.
 LCN CLOSERS
 LEHRER MCGOVERN BOVIS
 LESLIE CONTROLS
 MAINTENANCE AUTOMATION CORP
 MARCAM CANADA
 MARTIN/NORSE FURNITURE CO
 MASONITE CORPORATION
 MCC CONSTRUCTION CORPORATION
 MCCOURT MFG
 MECHANICAL INGENUITY
 MEDECO SECURITY LOCKS
 MID-AMERICA ENERGY RESOURCES
 MIDLAND ENGINEERING CO., INC.
 MITY-LITE TABLES
 MOTION CONTROL ENGINEERING
 MUSCO SPORTS LIGHTING
 NALCO CHEMICAL COMPANY
 NATARE CORPORATION
 NATIONAL RECREATION SYSTEMS
 NELES-JAMESBURY, INC.
 NEW HERMES, INC.
 NOVAR CONTROLS CORPORATION
 NUTEMP, INC.
 O & R ENERGY
 OGDEN ALLIED CORPORATION
 OPENINGS
 P.I. NEMIROFF CORPORATION
 PARSONS BRINCKERHOFF FACILITIES SUCS
 PEERLESS PRODUCTS
 PERIOD, INC.
 PERMA-CAP
 PHILIPS LIGHTING COMPANY
 PIER-ANGELI COMPANY
 PITTSBURGH CORNING CORPORATION
 POLYCOAT SYSTEMS, INC.
 POSTCRAFT COMPANY
 POWER ACCESS CORP

PSDI
 QUALITY ELEVATOR
 QUIET CONCEPTS
 RATIO ARCHITECTS, INC.
 RICWIL PIPING SYSTEMS
 ROESEL, KENT & ASSOCIATES
 ROLF JENSEN & ASSOCIATES, INC.
 ROOF CONSULTANTS INSTITUTE
 ROOF SPEC, INC.
 ROSEMOUNT ANALYTICAL INC.
 ROVANCO CORPORATION
 S.C. JOHNSON WAX
 SALSBURY MAILBOXES
 SANTANA PRODUCTS, INC.
 SAUDER MANUFACTURING COMPANY
 SOLIDYNE CORP.
 SONITROL CORPORATION
 SOPREMA ROOFING & WATERPROOFING
 SOUTHERN ALUMINUM
 SOUTHERN BLEACHER COMPANY
 SPECIAL-LITE, INC.
 STAGERIGHT CORPORATION
 STANLEY CONSULTANTS
 STANMAR, INC.
 STRANCO, INC.
 STRUCTURAL SEATING COMPANY
 STUARD & ASSOCIATES, INC.
 T CLEAR CORPORATION
 TARRANT PARTS
 TECTUM INC.
 THE F.A. BARTLETT TREE EXPERT CO.
 THE GEORGE B. WRIGHT COMPANY
 THE RESTORATION GROUP
 THE SYSTEM WORKS
 THE TRANE COMPANY
 THE WATT STOPPER, INC.
 THE WESTERN GROUP
 THE WIREMOLD COMPANY
 TMA SYSTEMS, INC.
 TODAY'S BUILDING SYSTEMS
 TONER CABLE EQUIPMENT, INC.
 TRENWA INC.
 TUFLEX RUBBER PRODUCTS
 TULLY
 UNITED SCANNING TECHNOLOGIES
 UNITED STATES PUMICE COMPANY
 UNITED TECHNOLOGIES CARRIER
 UTILX CORPORATION
 VICTOR STANLEY, INC.
 VON DUPRIN, INC.
 VULCAN SIGNS
 WEIL-MCLAIN COMPANY
 WESTINGHOUSE SECURITY ELECTRONICS
 WOOLPERT CONSULTANTS
 WORLD DRYER CORPORATION
 WW ENGINEERING & SCIENCE

1992 APPA EXHIBITORS

Perspective

Sharon L. Cramer

Ethics of Hazardous Waste Management

Physical plant administrators are caught in the web of federally mandated laws that includes a hazardous waste management program. I have heard from colleagues who refuse to implement such a program, proclaiming that it would be better to play Russian roulette and hoping that OSHA will not inspect their facility. The rationale is that if OSHA does not inspect for ten years, that constitutes a ten-year cost savings from not managing hazardous waste. If and when the inspection comes, the dollars to pay the fine will be available from previous years of non-compliance for hazardous waste management. It is a question of ethics for the physical plant administrator who chooses not to follow the letter or even the spirit of the law.

If we put hazardous waste management in the context of ethics, it should become easier to prioritize the needs in this area. The scope becomes much larger than a budgetary item. The impact of not managing hazardous waste is great for those who handle the waste within the work environment, the surrounding community, and the globe.

In the workplace, we typically use many products that will eventually become a waste problem. It always amazes me that so many staff members

use hazardous chemicals on a daily basis and refuse to recognize the potential for danger.

Managing wisely at the usage point is the first step in a good hazardous waste management program. Even though the Right-to-Know law and Material Safety Data Sheets have been presented to staff, this is not nearly enough to bring people to an optimum awareness level. The person in charge of controlling the MSDSs must review them for dangerous or hazardous products. We are mandated to advise staff of hazardous products and train them in their safe use. People are forgetful or perhaps even fall back into old habits of not caring about the safety of a product.

Routine discussions about substituting a safer product should become common shop talk and just as important as what size furnace filter to use or how safe an electrical box is. Train staff to inquire about what they purchase and to shop for a safe product. Some examples would be choosing an earth-compatible enzyme versus acid drain cleaner or using water-base paint instead of oil-base paint. The list can go on and on because manufacturers have been forced to come up with safer products.

The argument sometimes will be made that the more compatible or safe the product, the less effective it will be. An example is the type of bowl cleaner used in a housekeeping department.



Many housekeepers will say that they need hydrochloric acid to "really clean the bowl." The reality is that a phosphoric acid will work just as well, if the bowls have been maintained on a routine basis.

The cost of purchasing products that produce hazardous waste is reflected in our disposal costs. Share the facts and figures with the staff so that the stark reality of costs can make an impact on them. If we quietly collect and remove the waste, then staff becomes accustomed to this practice, and the process never reflects the fact that equipment or tools could have been purchased with money spent on hazardous waste management.

I have not tried it yet, but I would like to hold a contest among my shop staff

to see who can come up with the greatest number of safer alternatives. Staff members often must be challenged or inspired to be creative. Work becomes routine, as does the use of chemical products. Wise managers will find ways to engage their staffs in product shopping and comparison studies as this issue becomes more ominous.

The community at large is certainly affected by the hazardous waste we produce and could be devastated by



our mismanagement of it. Morally, we must accept responsibility for proper waste management. Administrators who dodge bullets from federal regulations are actually shooting themselves in the foot. The fact that our landfills are overflowing is a frightening matter; when we

consider the pollution of our earth and water, the prospects become deadly. Of course, hazardous waste doesn't merely stop at the local landfill and get innocently buried. It becomes a violent legacy for the future as it steals our well water and the very earth that we build upon.

To properly manage hazardous waste, seek out a reputable company that can advise, consult, remove, and ultimately dispose of the waste. Reputable firms will consider all options to manage your waste at the time of disposal. There are many options such as incineration, recycling, neutralization, and turning liquids to solids.

If we do all that is expected of us and work by the rules given to us, our chances of a chemical accident are reduced, injuries to employees are less likely to happen, and much less waste will be generated. Tangential to all of this is that morale should be higher with staffs that practice safety and conservation.

As global citizens we are charged with the care of our earth and the people who live here. Such an immense moral obligation should push us to move in the direction of recycling our hazardous wastes, purchasing similar but more earth-compatible products, and establishing a waste management program. Granted, the entire process involving hazardous waste is costly, but when comparing dollars to lives it becomes a moot point. Ethically speaking, hazardous waste management should be a top priority. ■

Sharon Cramer is superintendent, buildings and grounds, at Ohio Wesleyan University, Delaware, Ohio.

TOTAL QUALITY MANAGEMENT

FOR CAMPUS FACILITIES



by Gary L. Reynolds

There has been much discussion recently about the new buzzwords "total quality management" in the national press and within the university community. Numerous "experts" have written books, created videos, and presented seminars on the topic of TQM. These include the acknowledged management theory experts, as recently presented on public television's presentation, *Quality . . . or else?*, such as Blanchard, Crosby, Deming, Feigenbaum, and Juran, as well as many others who provide books and material on supervision, listening, managing, quality circles, and more. Each of these experts has identified a series of tasks or processes that they claim are essential in order to reach nirvana, i.e., total quality management. In some cases, the ideas are unique to the expert, in some cases they are complementary, and in other cases they are diametrically opposed. Is it any wonder that those of us in the trenches are confused?

It is clear from examination of the fundamentals of TQM that many of the goals espoused by the experts are virtually a bill of rights of management theory and that these principles can be held to be self evident. If we hold these ideals to be truly fundamental to good management, then the management style that is implemented should adhere to these principles without compromise. The key is to identify the few clarifying fundamental principles and to separate them from the many confusing issues. In the words of J.M. Juran in *Manage-*

rial Breakthrough, "Identify the vital few versus the trivial many." These vital few principles should then become a part of the alternative management style for quality services.

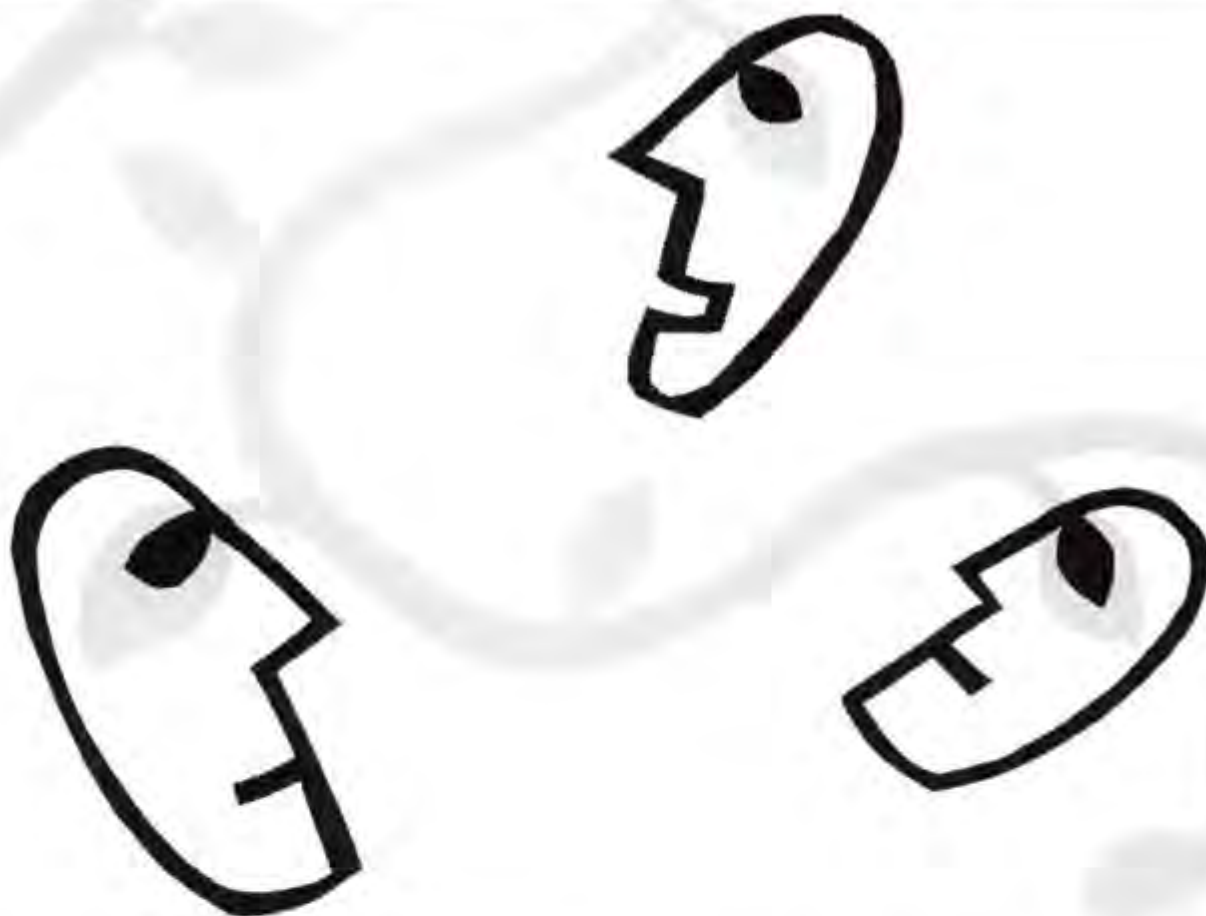
Once these underlying principles are understood, then a site-specific variation of TQM can be developed for your college or university. This alternative management style should support the underlying principles but be sensitive to the university specific environment. It is this approach of fundamental principle building and site-specific adaption that will best serve the university community in the long run.

DEFINITIONS

DBefore expanding on the fundamental principles, it is appropriate to discuss an interpretation of the meaning of the phrase "total quality management" and the word "service."

Total quality management—the phrase as a whole has taken on a certain esoteric meaning. But a better understanding may be possible if the phrase is examined as a sum of its parts. I would propose to start by defining the word "total" in two contexts. The first is the classically accepted definition that the process of total quality management will involve everyone, i.e., the entire work force. This definition is acceptable and is one of the underlying principles that is common to virtually every TQM methodology. The second context is derived from the concept that quality is not a one-dimensional issue, but a multi-dimensional perception of customer expectations and priorities. Since quality is multi-dimensional, then management of that quality must be multi-dimensional and all encompassing, i.e., quality in its totality.

Gary Reynolds is director of facilities management at Iowa State University, Ames, Iowa. He wrote about computer-aided drafting in the Summer 1986 Facilities Manager.



Quality is probably the most nebulous term in the phrase. For the support service departments in a university setting I believe that a useful, simple definition is "meeting the customer's expectations." Philip B. Crosby, in *Quality Without Tears—The Art of Hassle-Free Management*, defines quality as, "conformance to requirements." If we allow that the customer's expectations set the requirements then these two definitions are identical. This implies that the customer defines quality for the specific service being supplied. It also implies that different customers will have different expectations about different services. Virtually all of the TQM theories center on the customer and strongly recommend that processes need to be in place that identify the customer and the expectations of that customer for the services that are provided.

Peter Townsend in his 1991 presentation to the Central Association of College and University Business Officers theorized that there are two kinds of quality: "quality in fact" and "quality in perception." He went on to state that you do not have total quality unless you have quality in both. For example, you could have built the best bookshelf ever, but if the customer felt it took too long to build, then you may have quality in fact but not in perception. You may have done an excellent job of organizing the custodial staff, but if the staff is not considered responsive to customer needs, then you may perceive that you are providing quality custodial service, but there may not be quality in fact.

R. L. Lawton reaffirms this concept by citing three major factors that determine quality: 1) the objective performance of the service, 2) the perception of the service and related subjective experiences, and 3) the outcome achieved by use of the service.

In common terms, management implies control. Webster's

New World Dictionary seems to support this supposition by defining management as, "the act, art, or manner of managing, or handling, controlling, directing, etc." The word manage is defined as, "to control, guide, or work; to have charge of, direct, conduct, administer." These are the classical definitions. Many of these words used to explain the act of managing clearly convey the concept of controlling. This is important to remember as TQM is often characterized as changing the point of control by advocating bottom-up communication, inverting the pyramid, empowering the worker and thus, by inference, advocating no top-down management, erosion of the pyramid, and unempowering the manager. But the dictionary also uses such words as guide and administer—words that are less empowering to the manager, but not implying an abdication of authority.

And there's the rub! There needs to be a careful balance of "authority displacement" during the development of an alternative management style in order to ensure that middle management employees will not feel threatened by its implementation. TQM theories do not advocate 100 percent displacement of control or authority in any one direction, but they do imply that certain aspects of the management process are better provided from the top down while other aspects are better provided from the bottom up.

Ken Blanchard's "Legendary Service" typifies this idea by suggesting that there are two pyramids—the conventional pyramid with management at the top providing vision, strategic planning, leadership, and "setting the boundaries of the playing field," and the inverted pyramid where the staff controls the processes that carry out the vision and strategic plan within the boundaries of the playing field.

Service is another term that is difficult to grasp. Part of this fuzziness is due to the fact that the word service can be used as either a verb or a noun. When we think of the word as a noun we tend to focus on the product, i.e., the clean classroom, the repaired air handler, etc. However, the end product is only one part of the entire process of providing service. When we think of the word as a verb we tend to focus on the process, i.e., engineering, purchasing, etc. Thus, quality has two dimensions: an external dimension that is customer-focused to ensure that the end product meets, and even surpasses, customer needs, and an internal dimension that ensures that the process of delivery is as efficient as it can be and is customer-centered.

WHY CHANGE?

The forces that drive a for-profit company are not the same ones that drive a nonprofit support service within a university. For the nonprofit support service there are few incentives to be efficient, to care for the customer, to stay in business. After all, the university has been here for decades, the facilities have been here for decades, and they will be here for decades to come. The facilities have needed support services for decades, and they will need support services for decades to come. It costs what it costs. Why change?

The key in the nonprofit, low-incentive environment is quality of worklife issues. These issues affect the very core of human values and manifest themselves in the form of an employee's desire to work in a secure and stable environment, to be respected as a person and for the knowledge and skills he or she possesses, to participate in the decision-making process, to be recognized for a job well done, to enjoy coming to work. If an alternate management style could deliver these bill of rights to the employee, then employees are more likely to accept the duties that earn them these rights.

Peter Block in *The Empowered Manager* characterizes this approach as "enlightened self-interest," where we "define success in terms of contribution and service to customers and other departments. What we offer people as rewards are jobs that have meaning, the opportunity to learn and create something special, and the chance to grow in a business through their own efforts."

Crosby summarizes the underlying malaise in his book *Quality Without Tears*: "Employees are turned off to the company through the normal operating practices of the organization. The thoughtless, irritating, unconcerned way they are dealt with is what does it. They feel they are pawns in the hands of uncaring functional operations."

Crosby characterizes his vision of good management practices as a "hassle-free" work environment. He compares the hassle-free company with one that is not. "Being an employee in a hassling company is a lot like living at home after you grow up and having your parents decide all kinds of things for you. . . . A 'hassle' company is one in which management and employees are not on the same side. The 'hassle-free' company is one in which all employees are together and there are no sides. . . . Hassle means that the people inside the company spend more time working on each other than they do making something happen. . . . Hassle-free offers pleasant working relationships, a smooth system, and happy employees."

Peter Block echoes these thoughts when he cites an employee's lament, "We are told the organization values au-

tonomy and [then] we are treated like children."

So why change? The reward for employees, be they front-line staff, supervisors, or middle managers, is the opportunity to work in a hassle-free environment—an environment where customer complaints are minimal because the organization is listening and responding to the customer, internal as well as external; an environment where employees have no fear of communicating in any direction; where employees are empowered to solve problems (to delight the customer); and where employees are recognized for their skills and knowledge. If the hassles of worklife are eliminated, then the work force will be more responsive and productive. This is why the employees will buy into the change!

THE SIX FUNDAMENTAL PRINCIPLES

The six fundamental principles of TQM are as follows:

- ▲ Customer-centered orientation
- ▲ Leadership
- ▲ Improved communication
- ▲ Continuous improvement
- ▲ Accountability
- ▲ Quality of worklife

CUSTOMER-CENTERED ORIENTATION

Much has been said already about customer-centered orientation, but there are several key points that need to be emphasized. The first issue is, "Just who is the customer?"

There are both internal and external customers. Frequently, we ignore our internal customers and thus inadvertently create a hassling environment. The grounds department may be asked to dig a hole for the utility department; the design department may be asked to prepare a design for the carpentry shop; the accounting department may be asked for a project summary report by the construction department. These requests should be met with the same professionalism, forthrightness, and responsiveness that is being strived for with the external customer.

In most cases, the internal customer has a customer with expectations that you are helping to meet. The internal performance will have a direct bearing on the quality of service provided to the external customer. Also, respect from your peers is as important, if not more important, as respect from your external customers for establishing a strong self-image and providing quality service.

Success should be measured by how many times the customer is satisfied by the organization's response. In fact, today it is not enough to merely satisfy customers, but it is necessary to surprise them by going beyond their expectations—to delight them. R.L. Lawton notes, "Quality exists to the degree our customers are satisfied with, or excited by, our services."

What does this mean to the support services organization? It means that we need to understand the true goal of a customer's request. We need to understand the underlying reasons behind the desire to seek our services. The key to moving from ordinary service to quality service is to consider the outcomes or results desired by the customers in the use of our services. This understanding can only come about by truly communicating with the customer in an attentive and caring way. Jan Carlzon, CEO of Scandinavian Airlines, states it well, "In 1980 we saw every individual as a customer. In 1990 we see every customer as an individual."

So how does this apply to a university? First, know who

your customers are and understand their expectations. This may be done by regular visits with deans, directors, departmental executive officers, faculty members, or students; by using survey instruments; or by listening to what your employees are getting as feedback. Second, understand that all improvements, all changes, all processes used to deliver a service need to be designed with the customer in mind—not with your organization in mind, but with the customer in mind. Design the product or the process so that the customer's expectations are met, *not* so that it is easier or more expedient for your organization. Third, recognize that there are many attributes to a service and different customers will have different priorities for these attributes. And further, their expectations will be changing constantly. Therefore, you will constantly need to be measuring and changing to adapt to the changing customer.

Lawton nicely summarizes the need for customer-centered management:

"The most advanced total quality management or service quality management methods and techniques will have limited impact until the producer-centered cultures of our organizations are transformed into customer-centered cultures."

LEADERSHIP

Leadership is a key recurring theme in TQM or any other management theory. However, it takes on a particularly urgent need in TQM because of the complete change of the paradigm that is required to make an alternative management style work. Juran, in his review of past attempts at managing quality, noted that "personal involvement of upper managers in managing for quality has been the one element present in all successes and absent in most failures." Feigenbaum stated, "Quality is an ethic. Quality is a company wide process." It will take leadership in its truest form to set vision, define strategies, and supply resources for the customer-centered, quality-improvement ethic to become the paradigm for the decision making processes that will cause continuous improvement. Juran calls this "breakthrough in attitudes" and explains that it requires a "company climate for breakthrough" that can only be set with top-level leadership.

Creating a vision of the future organization can be a difficult task. Peter Block identifies several reasons why leaders may have difficulty writing down a vision and why other members of the staff may have difficulty believing that a vision statement is necessary. "In an implicit way, it signifies our disappointment with what exists now. To articulate our vision of the future is to come out of the closet with our doubts about the organization and the way it operates, our doubts about the way our unit serves its customers, and our doubts about the way we deal with each other inside the organization."

"The vision exposes the future that we wish for our unit and opens us up to potential conflict with the visions of other people. We know in our hearts that visions are not negotiable, and therefore we run the risk of conflicting visions, when we put them into words, with each other."

"Articulating a vision of greatness also forces us to hold ourselves accountable for acting in a way that is congruent with that vision. The vision states how we want to work with customers and users, and the vision states how we want to work with each other. Once we have created a vision and communicated it to the people around us, it becomes a benchmark for evaluating all of our actions."

The vision should include a statement of values—a clarification of what is truly important to the employee and to the organization. These values could include such things as having a family/community atmosphere at work, preserving our educational heritage, valuing our people and their skills and knowledge, having a safe environment in which to work, working in a fair environment, having a stable and secure job, being part of a greater purpose, having cultural diversity in the workplace, etc. These values are then translated into a vision of the workplace that is also communicated to the organization. For a university support service this vision may be one of an organization with a customer-centered ethic that uses participative management to create a quality work environment that continually improves while fulfilling its mission to the university.

If there is to be some authority displacement, it will take involvement at all levels to ensure success. It is upper-management's role to provide the leadership that sets the stage for this displacement to happen. There will be much fear and resistance by the middle managers who have heard that TQM means letting the workers "take over." A study in 1989 by the British Quality Association and the Institute of Personnel Management found that among 1,700 firms, 91 percent cited resistance to change on the part of managers as the major obstacle to progress.

But management does *not* abdicate its authority. Lawton noted that, "If there is no clear owner [of a process], there can be no easy control exerted on the process to produce what customers expect." Thus, leadership needs to ensure that during the authority displacement process ownership is not lost and that accountability is retained. This accountability is retained by the middle managers by having them provide the vision, define the strategies, and set the boundaries for the processes they "own." It will take strong leadership to define the process and set the levels of authority displacement that are appropriate for your institution.

In summary, implementing an alternative management style for quality service will require a major cultural shift that can only occur through leadership at all levels. The ethic of placing the customer first and then designing the service around the customer will require a clear statement of values, a vision of the future, and a strategic plan for implementation that only strong leadership can provide.

IMPROVED COMMUNICATION

Traditionally we think of communication in one of two ways: internally and externally. Internally, we think of the organizational structure and the communication that occurs up and down the organizational chain. Externally, we think of communication with our customers or suppliers as we receive or deliver products or services. However, there are other aspects of communication that play an important role in managing for quality. This communication involves such things as the dissemination of values that will provide guidance, education to change paradigms, training in problem solving, and recognizing accomplishments. All of these channels of communication are a part of an integrated whole that binds the organization together.

Vertical communication is perhaps the most difficult area to change. This change touches on the very essence of middle management's resistance to TQM concepts. There is the perception that this opening up of the vertical channel to bottom-up communication is a threat to job security. Because this is not the intent, it is important that a strong educational pro-

gram communicate the new reasons that vertical communications exist. As noted earlier, top-down communication provides vision, strategic planning, boundary setting, and problem solving, while bottom-up communication provides ideas for tasks, processes, and change.

In this scenario, upper and middle management does not go away. For example, in the custodial department the top-down communication might include such items as the vision of the work environment, the distribution of staff across facilities, and the setting of boundaries for flexibility that will allow response to an unusual customer request. The bottom-up communication could provide input on customer concerns, changes to the training curriculum, or a proposal to use a new style vacuum cleaner.

Horizontal communication also needs to be improved. Problem solving needs to occur with all the resources that have the ability to contribute. Cross-functional teams bring fresh outlooks, different paradigms, and other resources to bear on the problem. Juran noted, "Major quality problems are multi-functional and require multi-functional teams for solution."

Horizontal communication also needs to extend outside the service department. Many service departments are dependent upon other service departments in order to serve their customers. The physical plant department cannot remodel an office without buying materials through the purchasing department, and cannot bill customers without going through the accounting department. Juran noted that, "The vital few problems are, with few exceptions, interdepartmental." Therefore, cross-functional problem solving needs to extend beyond the immediate work unit. Cross-functional teams need to be created that include physical plant, purchasing, accounting, etc.

It can be seen that communication has to occur in a variety of ways and for a variety of reasons. Communicating vision, educating staff, and solving problems are just a few of the types of communication that must occur. Improved communication is an essential part of any management style.

CONTINUOUS IMPROVEMENT

Continuous improvement is the core of the TQM philosophies and should be the core of any fundamentally sound management style that aspires to provide quality service. Quality service is a direct result of continuous improvement. By placing this core issue in front of everyone every day, day in and day out, and by directing it toward appropriate issues, continuous improvement will affect quality. An atmosphere of creative entrepreneurship, of innovation that is nurtured and supported at all levels, is needed. Feigenbaum reaffirms this notion by stating that, "Quality and innovation are mutually dependent."

Continuous improvement can occur in two ways: small incremental changes or large fundamental changes. Both types of change are necessary and need to be promoted and supported.

Small incremental improvement is the least threatening means of creating change. Small changes imply that there will be no fundamental shifts in authority, responsibilities, or organization. They allow participation at the lowest levels where intuitive decision making is best carried out. Small changes will be accepted more readily and implemented with fewer resources. Small changes allow success to occur early

on in the process and to increase commitment for subsequent activities.

The management style itself has to become one of constantly questioning, evaluating, tweaking, and making small improvements. By making every step of the process of delivering a service subject to scrutiny and improvement, quality will automatically be built in. Quality becomes an inherent part of the process, not an attribute that is dealt with separately. This is one of the reasons why Deming says we need to cease dependence upon mass inspection. Crosby notes, "Quality is caused by prevention." The thousands of small corrective improvements made every day to prevent error and to improve the final product is an important part of an alternative management style. Statistical Process Control (SPC) is one of the methodologies that can be used for implementing this type of continuous improvement.

Using the mechanism of addressing continuous improvement through small changes is an excellent way of tying the fundamentals of the alternate management style together. Leadership is needed to start the process and improved communication is needed to train the staff, identify improvements, and implement change. Accountability is needed to ensure ownership and follow through, while a quality workplace, through continuous improvement, reduces hassles and improves morale.

Juran discusses the need to go farther than just making small changes. He challenges the concept that evolutionary change can always lead to significant system improvement. He defines breakthrough as "dynamic, decisive movement to new, higher levels of performance." Service performance can be compared to a control system. In this system there are brief excursions from the setpoint (desired level of performance) but the control system brings the system back in line.

Under Deming's philosophy we work to reduce the variance. However, in reality, to improve the system the setpoint needs to be raised to an entirely different level of performance. The difference is "control versus breakthrough"—where we are not only *controlling* the setpoint through small changes to maintain quality, but we are also using *breakthrough* analysis to make major setpoint changes. Juran summarizes this by stating that we need to "challenge the standard as much as the variance." Controlling, by its very nature, is limiting while breakthrough is expansive.

Continuous improvement-oriented management does not occur without well-defined direction, training in problem solving methodologies, and constant reaffirmation of the commitment. While the other five fundamental principles are important, the continuous improvement process is the core of the alternate management style. Total quality is continuous improvement—every problem is an opportunity for improvement, every improvement is a step towards total quality.

ACCOUNTABILITY

Accountability is where middle-management questions the validity of some of the precepts of TQM. They ask, "How can I be held accountable if I am going to give away all of my authority to bottom-up management?" The answer is that management is still responsible for the process of service delivery but is dependent upon the staff to ensure that the process is efficient and meets the customer's needs.

This is a new style of accountability. It is an

accountability that is less dependent upon end results and more dependent upon the process. Are we really concerned that every classroom is cleaned as scheduled? Or is the real question one of user satisfaction with the cleanliness of the classroom? It is an accountability that is defined by how well we have set a vision, provided strategic planning, and defined the boundaries of the playing field. It is an accountability that asks, "What have you done recently to delight a customer, to help a co-worker, to eliminate an unnecessary step in a process?" For many of us it is difficult to fathom this new way of being held accountable.

In managing a delivery of service the same thing applies. Know the process intimately, use the expertise of those who know the process, continuously improve the process, and there will be no need to meet a set goal as the quality of the service will automatically be built in. Therefore, our jobs as managers is to manage the process of continuous change and to be held accountable for that continuous change rather than the specific delivered service. This is one form of authority displacement.

For example, the manager of mail services should be setting a vision for the service, constantly reviewing the expectations of the customers, providing for the continuous examination of the process of mail delivery, and providing the resources to make continuous improvement. The staff of the mail service will implement the process to the best of their knowledge and ability with the resources provided. The manager will be judged by how many changes to improve the process have occurred, and the staff will be judged by how well the process meets customer needs. Top-down management should be used for vision, boundary setting, and resources and bottom-up management for implementation, continuous improvement, and customer satisfaction.

Ken Blanchard calls this seemingly perplexing oxymoron "directed autonomy." He goes on to add the additional concept of "selective disobedience." As managers we need to create an environment where employees have the freedom to move about within set boundaries but can selectively disobey a rule if the disobedience meets a higher objective. The waiter can give away a meal without management's permission if the waiter feels it is necessary to satisfy a customer. The housekeeper can provide a complimentary room to appease a guest. The custodian can help a staff member clean an office. All are examples of selective disobedience.

Accountability? These employees are part of a team that has limited resources and they know it. They know the impact on those resources if too many meals, too many rooms, or too much time is spent outside normal duties. If vision and direction have been set, and the communication of that vision and direction has been good, accountability will be there.

Accountability is centered upon the goals and objectives that strive to fit the vision of the organization. Sometimes changing constraints and boundaries is confused with changing goals and objectives. This is frequently misinterpreted by employees as directionless management. As resource availability changes or external political, social, or economic events occur, it may be necessary to modify the boundaries and set new constraints. But the key here is that the fundamental vision and underlying management principles never change.

This will become extremely important when nothing seems to make sense or have any consistency. The vision that you create will be the foundation to which you and your organization can return for assurance and reaffirmation. That vision must be accurately and zealously communicated with the

staff so that they have the same sense of constancy and can find the strength that is needed to deal with the changing times. Without vision there will be no constancy of purpose, and without constancy of purpose there will be no stability, and without stability there will be no job satisfaction, and without job satisfaction there will not be a quality work environment.

QUALITY OF WORKLIFE

Q In the public sector this issue becomes the one piece of leverage that can be used to get the staff to buy into an alternative management style. Federal Express CEO Fred Smith said it best: "We learned a long time ago that employee satisfaction is a prerequisite to customer satisfaction."

Paul Levesque echoed this thought: "Positive self-image should not be thought of as a pleasant by-product but as a prerequisite to continuous improvement."

Part of the process of building a quality work environment needs to be finding out what is important to the staff and what will help to build their self-esteem. What is a quality work environment as defined by your staff at your school? Is it participating in the decision making process? Is it working in a secure and stable environment? What will build self-esteem? Is it to be respected as a person? Is it receiving thanks for a job well done? There are many personal values and these need to be clarified. Once these values have been identified they can become a part of a bill of rights that embodies the core values that will guide the organization in living up to its vision.

One of the ways to help an employee build self-esteem is to empower him or her to please the customer. It is intoxicating to delight a customer. We need to create a work environment where the flexibility exists to please a customer and where it allows the employee to participate in that delight, see that customer smile, feel the warmth of success. If we accomplish that, then we will have created an environment that excites the employee. Once an employee has an opportunity to feel the excitement of self-determination while providing quality service, the concern for self diminishes as he or she becomes part of something bigger.

Unless your organization has specifically worked to drive out fear, there is still a barrier that inhibits communication. You may think you have a friendly environment that encourages ideas to come forth, but unless the entire work force is involved in the program and trained to participate there are still roadblocks. It is common that one or two departments have good communication between employees and management. But does that department have good communication with another department? Can the plumbing department tell the design department about a different way to design an installation? Can the design department make recommendations to the purchasing department about a different way to procure an item? In the quality work environment we are striving to achieve, these types of communication would not only occur, they would be strongly supported at all levels. This support could come in the form of training methods that teach both staff and management about teamwork and communicating in the everyday workplace, or more formally, through the implementation of cross-functional teams and statistical process control.

One of the key differences in the alternative management style is what is celebrated. No longer do we celebrate the

number of classrooms cleaned properly, the dollar volume of design work completed, or the number of trees planted; rather, we celebrate the number of process improvements made, the number of customer compliments we received, or the number of hassles we've removed from the work environment. These are the issues that now take on new meaning and significance.

As the staff receives recognition for their accomplishments they will strive to do more. Thus, more process improvements will occur, more compliments will be received, and more hassles will be eliminated. Then reluctant employees will see that those employees who have elected to be a part of the new quality work environment are really enjoying work. Then some of the reluctant employees will want to be a part of the new organization that they now view with some respect. When they join in, the work force moves up another notch in productivity. A quality work environment creates a productive work force. A productive work force constantly improves. And a constantly improving work force creates a quality work environment.

In summary, in a public institution of higher learning, where many restrictions are placed on incentives that may be used to reward employees, it is important that the development of a bill of rights be central to any alternative management style. To reiterate Peter Block's sentiment, "Success is defined in terms of contribution and service to customers and other departments. What we offer people as rewards are jobs that have meaning, the opportunity to learn and create something special, and the chance to grow in a business through their own efforts."

Isn't It Time to Unlock the Door to Better Key and Lock Management?



SecureKey™ is a state-of-the-art computerized key and lock management system that provides instant access to key and lock records. It quickly shows the relationship between keyholders, keys, and a facility's doors. It's so simple to use that even a novice computer user can access information with just a few quick keystrokes. On-line help menus make operation a snap. There's also unlimited toll free support. And if you're not completely satisfied with **SecureKey™** for any reason just return it within thirty days and we'll refund the purchase price! Unlock the door today to better key and lock management!

Special Introductory Offer SecureKey™ just \$199.95!

For a limited time we're slashing \$200 off the \$399.95 retail price! Order **SecureKey™** today and pay only \$199.95. Try **SecureKey™** risk-free for thirty days! To order **SecureKey™** call 1-800-441-0641. American Express, Mastercard and Visa accepted.

System Requirements:

IBM compatible, DOS 3.1 or higher, 640K memory, Hard disk, Monitor, Dot matrix printer.

Management Systems Corporation, 200 Tech Center Dr., Knoxville, TN 37912. **SecureKey™** is a registered trademark of MSC. All rights reserved. Copyright 1992 MSC.

1-800-441-0641



THE ALTERNATIVE

The support services at a university are a valuable asset of the institution. During these times of limited staffing and budgets and increasing demands, support services are quite often the most responsive and creative in maintaining service while limiting the effect of these constraints upon their customers. In many cases we do some things very well and in others, not so well. However well we are doing, we probably agree that there is room for improvement. The suggestion being made here is that there are known, formal ways of creating a culture of continuous improvement that can ensure that improvement actually does occur. It is a way of changing the process from one of accidental improvement to one of structured, ensured improvement. There is no need to reinvent the wheel as the methods have already been well thought out and applied with success in many cases.

Where we have failed to embrace these structured continuous improvement techniques we have used the excuses of, "We don't have the resources," "We don't have the time," "We don't have the right type of people," "It's just another fad," "That's fine for profit-driven private industry but it will never work at a public institution." What I cannot believe is that we want to continue working in an environment where we are constantly struggling to just get the work done, in a hassling workplace, under a constant barrage of criticism and threats, with no end in sight. There is an alternative. It can be reached by creating a vision that promises relief from this difficult work environment by putting into place a formal methodology that shows everybody we are serious about moving toward that vision. Physical plant can thus become a place that is rewarding and worth dedicating a lifetime of effort. ■

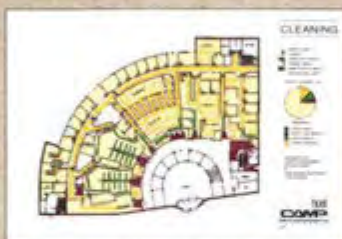
REFERENCES

- Blanchard, Ken, et al., *Legendary Service*, Blanchard Training and Development, Escondido, CA.
- Block, Peter, *The Empowered Manager*, Jossey-Bass Publishers, San Francisco, 1987.
- Crosby, Philip B., *Quality Without Tears—The Art of Hassle-free Management*, McGraw-Hill Book Co., New York, 1984.
- Crosby, P.B., "The Great Quality Management Mystery," *The Journal of Quality and Participation*, March, 1990.
- Feigenbaum, A.V., "Quality: An International Imperative," *The Journal of Quality and Participation*, March, 1991.
- Feigenbaum, A.V., "In Quality the Keyword is Total," *The Journal of Quality and Participation*, Vol. 11, No. 1.
- Juran, J.M., *Managerial Breakthrough—A New Concept of the Manager's Job*, McGraw-Hill Book Co., New York, 1964.
- Juran, J.M., "Managing for Quality," *The Journal of Quality and Participation*, Vol. 11, No. 1.
- Lawton, R.L., "Creating a Customer-Centered Culture," *Quality Digest*, September, 1991.
- Levesque, Paul, "Having Fun With Quality Management," *Quality Digest*, September, 1991.
- Townsend, Peter, *TQM Does Not Mean Timid Quality Management*, presentation at CACUBO, Denver, 1991.

There are many more advantages to a HOST CAMP[®] plan than having clean, beautiful carpet all year at less cost.



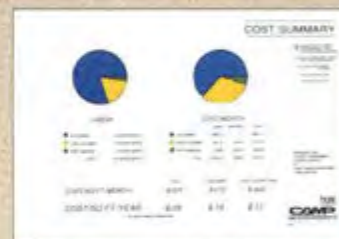
CAMP vacuum diagram shows where and when to vacuum.



Cleaning diagram shows where and when to HOST Dry Clean.



Calendar schedules all carpet maintenance for year.



Cost Summary details material, equipment and labor costs.

Clean, beautiful carpets every day, everywhere in your facility may sound like an unaffordable luxury, but it isn't. In fact, it will cost less than you're currently spending...and your carpet will last years longer.

Clean carpet all year at less cost is just one of the benefits of the HOST Computer Aided Maintenance Plan (CAMP[®]). CAMP is a management tool that significantly reduces labor and material costs, provides accurate cost

estimates for budgeting, schedules all cleaning activities for the whole year, facilitates supervision of your in-house cleaning staff or outside contractor, helps generate work orders, and extends carpet life.

Why not find out more about HOST CAMP and the HOST System. And if you'd like to know more about protecting your carpet assets, attend a HOST School or HOST Seminar.

- HOST CAMP lets you maintain all your carpet in optimum condition all year at extremely low cost.
- HOST CAMP improves carpet asset management and extends carpet life.
- HOST CAMP provides the information needed to manage and direct an in-house staff or outside contractor.
- HOST School is an invaluable experience for those with responsibility for protecting carpet assets.
- HOST is recommended by carpet mills worldwide.

For more information about HOST[®], CAMP[®],
Case Studies, Schools, Seminars and Videos:

1-800-558-9439

Fax 1-414-637-0558

Racine Industries, Inc., 1405 Sixteenth St.,
P.O. Box 1648, Racine, Wisconsin 53401-1648

©1992 Racine Industries, Inc.

CAMP[®]
COMPUTER AIDED MAINTENANCE PLAN
FOR CARPET

host
The Dry Extraction
Carpet Cleaning System

CONTINUITY AND CONTRADICTION IN CONTEMPORARY CAMPUS ARCHITECTURE

by Werner K. Sensbach



It has been said that campus architecture is too important to be left to architects. Whether pointing an accusatory finger at design professionals, or just calling for a more personal and passionate involvement of the university community in the shaping of its environment, this observation also seems to hint at deeper, more pervasive problems of campus architecture. It is no secret that college buildings constructed in the last quarter of a century have, in many instances, torn the delicate fabric of the traditional campus and, despite the passage of time, have remained unloved intruders in the architectural environment of universities and colleges. Yet what could be the reasons that modern, practical, technically advanced buildings should have caused the loss of the intangible aesthetic architectural values that once accounted for the exquisite ambiance of the academic environment?

A Guide for the Perplexed

How can college presidents, planning committees,

Werner Sensbach retired last year as director of facilities planning at the University of Virginia. His article on illuminating the university campus appeared in the Spring 1990 issue of Facilities Manager. Sensbach lives and paints in Charlottesville, Virginia.

and architectural experts discover that there may be aesthetic problems with their campus grounds if the symptoms are so elusive and difficult to pin down? A tour across the campus grounds may be the first step on the road to discovery and restoration.

Traditionally, visitors to a university campus have enjoyed guided tours through the campus grounds conducted by friendly, loquacious student volunteers working for the admissions office. It may happen that after an entertaining walk over old brick pavement, along porticoed halls, animated by tales of the college's founders, faculty follies, student stunts, town-gown tensions, and construction data, the guide may suddenly stop to exclaim, "From here you may observe the more recent university buildings. They are marvels of technology. If you are interested you may proceed on your own." As Gertrude Stein said about Oakland: There is no "there" there.

This not-so-fictional scenario could take place, with local variations, on almost any large campus on the North American continent with a history extending over half a century. Visitors could justifiably wonder what reasons may have caused the buildings constructed since the 1950s to be so alien to the

Large, self-referential campus structures resist the creation of traditional campus forms.

local architectural tradition, appear interchangeable with almost any other modern college building in any part of the country, and be so resistant to integration into the campus fabric. Why should advancements in building technology have diminished the quality of the academic environment?

The chronological appearance of the new buildings on American campuses ties them to the college building boom in the mid 1960s, spawned by the post-war baby boom generation. Even a superficial glance at the campus map or aerial photographs quickly reveals the break between the small-scale buildings of the pre-1950 period and the massive modern structures put up since then.

Responding to the urgent need for more classroom space, laboratories, and gymnasiums, the architects ignored the lessons of the past and applied modern, "Bauhaus" style architecture to produce technologically progressive buildings. Large, self-referential, fortress-like, windowless, faceless, massive structures have muscled their way into the fragile framework of the old campus, offering new building technology but turning their back on architectural context and ignoring social content. Something of value to human life and social interaction seems to have gotten lost in exchange for efficiency and air-conditioned comfort. By abandoning ornament, architects felt the need to turn the whole building into an ornament, giving use to many egregious, frothy, faddish architectural inventions.

What were the values in academic architecture that universities seem to have given up so lightly? Could a better understanding of the development of the historic campus help us to recapture at least some of the essence of the things we have ignored in the headlong drive for progress?

The Dialectics of Design

Nearly 2,000 years ago, the Roman architect Vitruvius postulated that architecture should provide firmness, commodity, and delight. It is the definition of "delight" that still troubles us today. Contemporary campus architecture probably has as many admirers as it has detractors. Yet at times, many who try to give voice to their sentiments may find it difficult to put into words exactly what it is they like or dislike about a particular work of architecture. It could be its design, the placement on the site, the choice of building material, the ornamentation of the building, or the landscaping. Mostly, it's just a feeling, a response, a reaction, a passing sensation of pleasure or discomfort that has left an impression in our memory.

The individuals responsible for guiding the design and development of new buildings on campus frequently face the agonizing experience of having to make split-second decisions on critical aesthetic issues at the moment the architect presents a building design for approval. This decision-making group may include college presidents, deans, members of building committees, governing boards, art review councils, city planning commissions, neighborhood organizations, professors, students, administrators, and accountants. With complete faith in the technical competence of the design team of architects and engineers, the critical audience is often torn between the emotions of acceptance and rejection, elation and confusion, isolation and fear of displaying ignorance in the face of major aesthetic issues. Could this be the consequence of being treated to a dialectic of design of such exquisite sophistication that the audience may feel at a loss and give up hope?

Architects, similar to many contemporary artists in music,



An uneasy alliance of old and new structures on the Cornell Campus.

painting, and sculpture, have developed the mastery of metaphoric manipulation, confronting artistic novices with such arcane terms as: bilateral symmetry, canonical diagonal, paradoxical pastiche, recondite abstraction, parody of the past, ironic reference, deep structure, and message to the future. As Alexander Pope observed, "He gains all points, who pleasingly confounds, surprises, varies and conceals the bounds." Wallowing knee-deep in architectural slogans, not many listeners dare to admit that they have understood little of the linguistic pyrotechnics, but only wish to know the cause of the artistic mysteries surrounding the design of a simple college building.

Architectural Expression Reflecting the Educational Mission

From the beginning, the American public has held dear to its heart the campuses of its colleges and universities. Situated in sylvan settings, far away from the toils, temptations, and turmoil of the commercial cities, American campuses traditionally have represented the model of ideal communities. This community of scholars—engaged in the earnest pursuit of abstract or useful knowledge and leading the cloistered life of study, research, and philosophical inquiry—inhabited groups of buildings of modest dimensions but great architectural beauty. Tree-shaded campus walks induced stu-

dents and professors to carry on learned dialogues and extend knowledge and ideals from the classroom to the world beyond.

With its respect for education as a means of self-improvement, American society has assigned an exemplary role to the American campus. Colleges and universities have been diligent in cultivating and polishing this image ever since and, for the

most part, have met with success and the approbation of an admiring public.

In addition to the large number of rural campuses, American universities for more than a century have brought higher education to the doorsteps of city dwellers in densely built-up urban areas. By the turn of the century, the University of Chicago settled along the midway left by the World's Columbian Exposition in the Highland Park neighborhood on the

south side of Chicago. In 1884, Temple University established itself in the midst of a working class neighborhood north of downtown Philadelphia as the prototype of the "street car college." New York City College covered the city with a network of tuition-free colleges, serving as greenhouses for great future intellectual leaders. Charged with a similar mission, the community colleges of the 1960s emerged in response to the need of a changing society, yet as a logical extension of a long-time educational tradition.

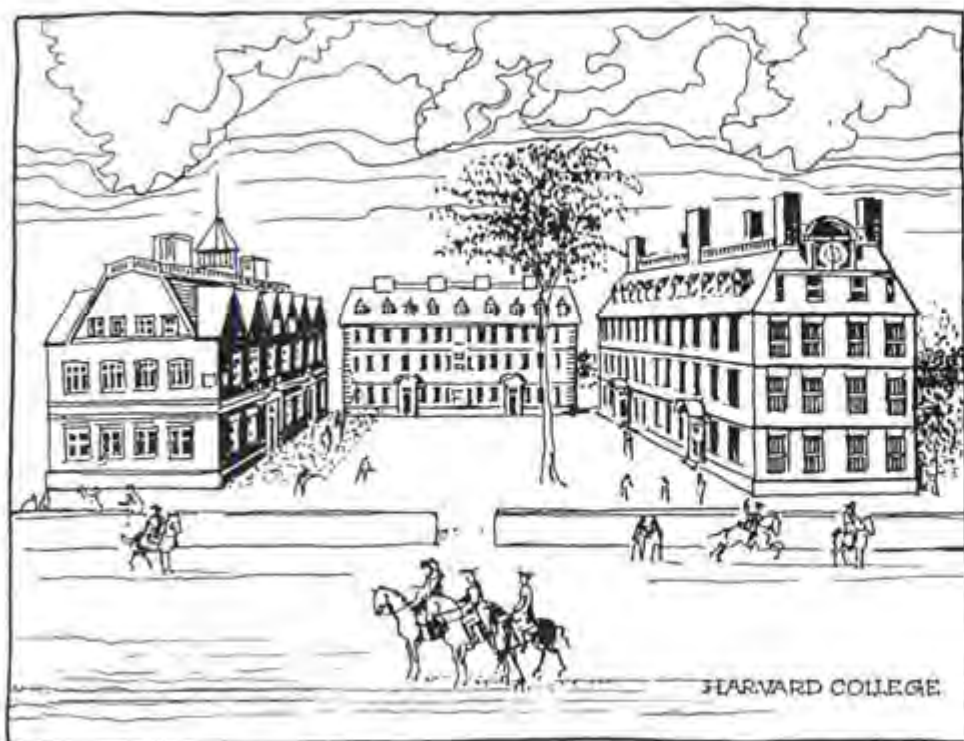
Today, the American campus as reflection of a rapidly changing society has expanded far beyond its modest beginning. In 1990, nearly 12 million students attended more than 3,000 institutions of higher learning.

Whether on a rural or urban campus, American colleges and universities are still society's principal means to open up gateways to knowledge, skills, and better understanding of the world in which we live. They also hold the key to economic success, respect accorded by society, and the promise of personal fulfillment. It is within this expanded understanding of the educational mission that the architecture of universities and colleges has served in providing the physical framework, the comfort of shelter, and the stage set on which the rituals of academic life can be played out. With the financial help of a supportive society and the talents of design professionals, colleges and universities have succeeded in creating campus environments of architectural excellence to the satisfaction of an approving society. Only in recent years have invisible subsurface strains of the industrial society begun to

Silhouettes of Buildings

"It is a mistaken idea to consider roofs as more matters of convenience and utility. Roofs on the contrary, assist materially in embellishing or destroying the general effect of the whole building."

Sir John Sloan, *Lectures on Architecture*, 1809-36



Harvard University, with its enclosed yard, represented the prototypical concept of the Colonial American College.

cause visible cracks in the edifice of architectural aesthetics, to the great consternation and confusion of the academic community. A view into the artistic rear mirror of collegiate architecture may steady our course and inspire our aesthetic aspirations.

Campus Architecture in its "Proper Style"

American university campuses have traditionally provided the perfect environment in which architectural styles can be displayed, tested, preserved, or discarded. Rarely has the search for an appropriate style been more intensive than in the last quarter of a century when the architecture of the marketplace and the mechanical world has invaded college campuses.

Need for Ornament

"By now, many architects have become aware of a self-imposed poverty: In absorbing the lessons of the machine and in learning to master new forms of construction, they have neglected the valid claims of the human personality. In rejecting antiquated symbols, they have also rejected human needs, interests, sentiments, values, that must be given play in every complete structure."

Lewis Mumford, *Symbol and Function in Architecture*, 1951

Is there a "collegiate style" of architecture? Thomas Jefferson designed the buildings of the University of Virginia in a neo-classical style reflecting the virtues of democratic Greece and republican Rome as appropriate symbols for the new American nation. Yale, in the latter part of the nineteenth century, tore down several of its modest brick dormitories from the Colonial period and, under the influence of John Ruskin's theories, replaced them in the "only proper, the Gothic style." The University of Colorado, in 1922, adopted an Italian hill-town style using rose-colored sandstone from the nearby Rocky Mountains and red tile roofs, a decision that, to this day, has assured continuity in the use of material and design.

For Rice University in Texas, architects Cram, Goodhue, and Ferguson, having successfully used a soaring Gothic style for Princeton University and West Point, "invented" a new style from memories of a Mediterranean cruise. R.A. Cram wrote in his autobiography, "I reassembled all the elements from southern France and Italy, Dalmatia, the Peloponnesus, Byzantium, Anatolia, Syria, Sicily, Spain and set myself the task of creating a measurable new style." It is to the architect's credit that he succeeded in combining these far-flung influences into a creditable, visually pleasing college architecture. The Rice campus, in the words of faculty mem-

ber biologist Julian Huxley, "is an extraordinary spectacle, as of places in a fairy story."

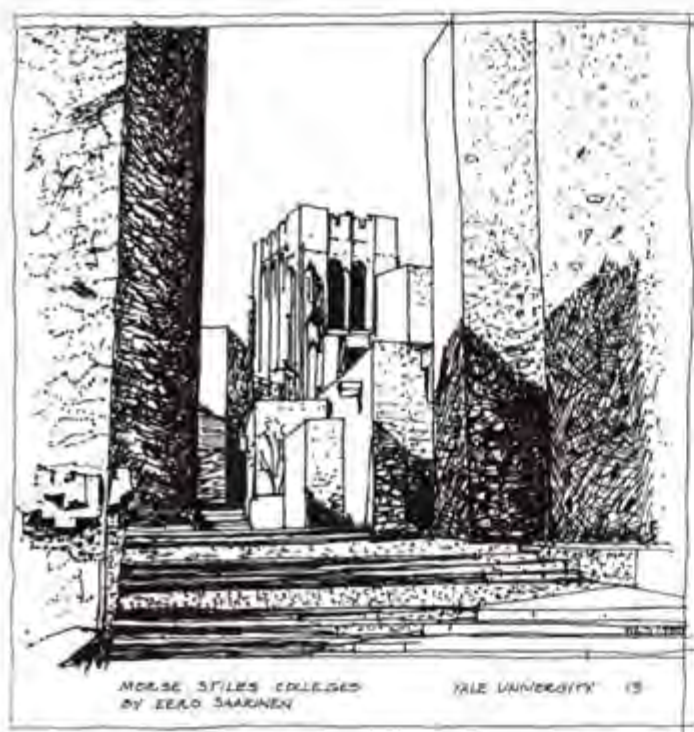
Yet possibly the most inspiring and instructive example of twentieth century college architecture grew under the creative hands of the Finnish architect Eliel Saarinen when he designed and directed Cranbrook Academy in Michigan. Officially established in 1932, Cranbrook revealed the Bauhaus influence on design in America. As it expanded, it emerged as a laboratory of the imaginative use of traditional building material, urban design, landscape, perspective, and the use of sculpture. In the eloquent words of



W. v. Eckart: "Saarinen achieved unity by linking buildings in a web of walkways, passages, courts, terraces, and stairs. He invites us to stroll in this compact, intricate, almost medieval townscape. At the end of each vista, a sculpture or other point of interest draws us from one place to the next. Cranbrook's crescendo is the classic grand peristyle . . . with fountains in front and back, splashing Swedish sculptor's Carl Milles' sensuous bronzes."

Cranbrook Academy is built in the best Jeffersonian tradition. Thomas Jefferson thought "the greatest hazard for new colleges will be their over-building themselves. Large buildings are always ugly, inconvenient, exposed to accident of fire . . . A small building for the school and lodging for each professor is best . . . connected by covered ways out of which

Cranbrook School offers an environment of soft landscape and human-scale college architecture.



the rooms of students should open. . . . In fact an University should not be a building but a village." [Thomas Jefferson's letter to L.W. Tazewell, 5 January 1805.]

The problems of contemporary campus architecture therefore appear to be those of scale rather than of style. The values of mechanized society have generated countless singular, inward-directed "signature" buildings. On nearly every campus, large intimidating structures turn their backs on their natural setting or architectural context, ignoring the students' aesthetic and social needs.

Serving as set for the movie *Planet of the Apes*, one of the newer California campuses (started in the 1960s) paraded itself as the sound-bite of the overscaled, disjointed, utopian, architectural artifact.

Rediscovering Human-Scale Architecture

The seemingly irreversible process advancing toward an increasingly complex, cybernetic civilization was first sensed by the students in the 1960s and 1970s when they denounced technical demagoguery and the disintegration of the scholarly community into academic downtowns and student suburbs.

No institution was more clear-headed and consequential than the University of Oregon when, in the early 1970s, it radically changed its planning approach. In its great experience, and with the assistance of architect Christopher Alexander, it moved from hard-edged drawings to setting up a planning process to implement six planning principles that would achieve order in the campus environment. The pivotal element in the Oregon Experience is the "communal pattern language" developed with community agreement to guide every building project. "All decisions about what to build and how to build it will be in the hands of the users," the plan stated. And further, "The construction undertaken in each budge-

tary period will be weighted overwhelmingly toward small projects." Patterns so developed addressed such issues as desirable university growth rate, the relationship of the university and the town, knitting living and learning environments together, and the character of common spaces. "The well-being of the whole will be protected by an annual diagnosis, which explains which spaces are alive, and which ones are dead, at any given moment in the history of the community." With the help of this daring democratic, difficult, and truly humanistic process the Oregon Experiment has succeeded in retaining much of the quality of its traditional campus environment.

As we approach a new century and as many universities are coping with the consequences of retrenchment and austerity, the time may be propitious for a reconciliation of rationalism and idealism. To fill the philosophical vacuum left by the loss of traditional values, universities need to redefine the meaning of humanism as they translate recurrent human needs into material form.

The Garden Within

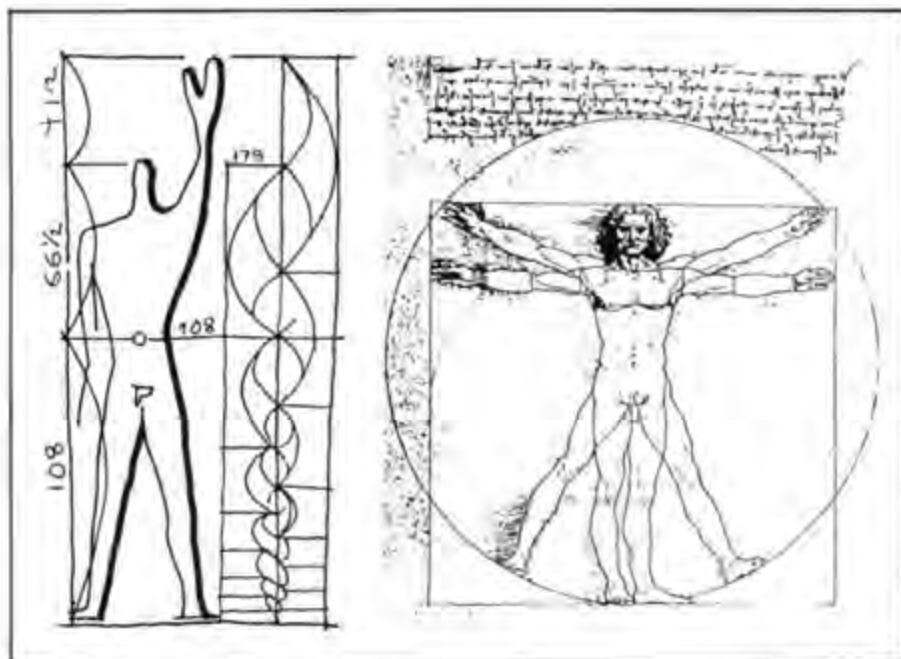
When a university employs a design professional for a building or landscape on its campus, it also enters into an intense personal relationship and engages in a searching dialogue on aesthetic expectation of the participants. Designers, with all their verbal dexterity, are also good listeners, capable of sensing and interpreting the desires and needs of a varied collegiate constituency.

At this stage of the design process, both architect and university representatives will benefit from a mutually supportable architectural philosophy guiding the development of the physical college campus. Such "design guidelines" may be part of a university's long-range master plan, or they may be established in response to the specific conditions of a building or site. Reflecting the variety of American campuses—large or small, rural or urban, traditional or contemporary—design guidelines, if judiciously applied, ease the daunting task of creating order in a complex setting. Its first advantage is the establishment of an architectural vocabulary that carries the same meaning for all participants in the planning process.

Each university will want to discover and declare its own design goals that will serve best its own campus conditions.



Yale's Morse-Stiles colleges introduce a medieval image of enclosure at the edge of the campus, set against the intrusion of the commercial street (above).



Reflecting the architectural setting, educational mission, and aesthetic values, design guidelines for campuses may include observations such as the following.

1. Individual campus buildings should be subordinate to the campus spaces in which they participate, be these quadrangles, malls, or streets. Establish a hierarchy of spaces, from large to successively smaller units.
2. Campus spaces should be thought of as outdoor rooms, in which buildings are the walls, walkways and lawns are the floor, and trees are the ceiling.
3. The common ground of the campus quadrangle, surrounded by simple non-competing buildings, should define a space that is both a point of destination as well a place of passage.
4. Accept the limitations of the human eye to recognize objects and activities as the basis to establish human scale. Urban spaces not wider than 80 feet across are perceived as "intimate," at 450 feet they are "civic," and at 4,000 feet they are "monumental." The eye can recognize facial expressions at 40 feet distance, faces at 80 feet, body motions at 450 feet, but cannot see an object when at a distance 35,000 times larger than its size.
5. Large building volumes should be set back from the pedestrian precinct, to avoid overwhelming scale, large shadows, and blinding reflections from building facades.
6. Rediscover and make use of the Renaissance knowledge of the relationship of building heights, and the width and length of the open space formed by structures. For minimum enclosure at 30 degrees, and with uniform facade height, the length-to-width proportions of the square should be one-to-three, according to a Renaissance rule-of-thumb.
7. Discourage the design of "signature" buildings. They are a hard act to follow and lead to subsequent architectural high-wire acts.
8. Encourage inventiveness, and efficient building function, but avoid design fads. They resemble impressions left by abandoned buildings on world's fair exhibition grounds.

9. Make the landscape, the choice of trees and the sequence of open spaces, the essential elements of coherence and continuity. Preserve significant vistas; make the visual sensations of the pedestrian scholar the measurement of design satisfaction.
10. Make a "lawn of grass and trees" (as suggested by Thomas Jefferson) the primary design element sheltering campus spaces. Where appropriate, introduce intermediate landscape groups, but avoid "prettifying" the campus with landscaping schemes more fitting to a private home. They are perishable and expensive to maintain.
11. Design campus spaces that are pleasant to experience and easy to understand.

Upon entering a campus space, a pedestrian needs to see and understand the size of the open space, the height of the buildings, the number of floors, the entrances to buildings, and the walkways across the open space.

12. Introduce light and shadow in the design of the exterior of buildings; avoid "dead" walls. Welcome elements of symbolic architecture, such as columns, arched entranceways, ramps, and stairs as an enrichment of the architectural environment of the university.

The list of "desiderata" could be modified and expanded at will to reflect local conditions of topography, climate, urban proximities, and institutional mission. Once these requirements have become routine review criteria, they will quickly prove their usefulness to designers and university officials in the development of architectural projects for the college campus.

The Sharper Image

In an age of discontinuity, when young people look for life-sustaining values useful for the years ahead, universities are beginning to learn to treat the architecture of the campus as a powerful educational tool, working in concert with the academic program of the institution. If a new generation of students is beginning to express its concern about the quality of the campus, its buildings, landscape, and the ambiance of its environment, it will be well to remember the importance of the college years in the life of an individual and, by extension, of the human community.

For most students, the long years spent in academic pursuits on a university campus mean not only an important period of maturing from adolescence to adulthood, but also years of heightened sensory and creative ability. These are years when the powers of feeling, of reflection, of reasoning and memory, have reached a greater degree of sharpness than ever before. During college years, young open minds absorb impressions that last for a lifetime, leaving memories of the myriads of forms and substances of life, a stream of blazing pageantry of images, shapes, odors, sounds, colors, and the feel of things. Whether "academical village" or "science city," the American campus serves superbly as an example for Aristotle's definition of the urban community as a place "where people live a common life for a noble end." ■

Permanence of human scale: Image of Renaissance man, by Leonardo Da Vinci, 1500 A.D., (above right). Image of Modern Man, "Modular" by Le Corbusier, 1929 (above left).



Residential Facilities Maintenance:

A UNIVERSITY HOUSING PERSPECTIVE



All photos courtesy of Illinois State University

by Floyd B. Hoelting and David A. Cain

The debate continues between housing and physical plant directors as to whether the best allocation of resources to provide auxiliary organization maintenance is through a decentralized or a centralized approach. This debate is being taken to higher administrative levels due to ever-tightening auxiliary budgets and state laws that mandate the appropriate use of auxiliary funds. Like the rest of the nation, many universities are in a period of economic hardship, and administrators are implementing methods to maximize resources.

The authors surveyed persons responsible for housing maintenance at state-supported universities to determine if maintenance is performed by a centralized physical plant department or through a decentralized effort using mechanics working out of the housing office. Also solicited was information regarding levels of satisfaction with this service at each university. It is yet to be determined if one method is best, although this article and research suggests a growing national preference for the decentralized approach to university housing maintenance.

Floyd Hoelting is director of residential life and food service, and David Cain is director of residential life facilities, at Illinois State University, Normal, Illinois.

Literature Review

The management of facilities has become the largest non-academic support function of higher education (Middleton, 1989). In the last ten years, campuses nationwide have experienced rapidly decaying facilities (APPA, 1989; Saunders, 1989), and residence hall maintenance has become a primary concern of university administrators. Maintenance issues that have a special impact on housing administrators are "changing demographics, renewal and renovation of aging facilities, the need for expansion, budget issues and the need for accountability, and the high expectations of the community" (Jankey, 1989). Added to these concerns is the fact that federal regulations governing such issues as access for people with disabilities, pollution, asbestos abatement, and security are becoming more complicated and restrictive.

In the words of Charles Frederiksen (1983):

Housing officers are responsible for the success or failure of the housing and food service operations at their universities . . . and should have the authority to respond directly to those needs most common to the success of a housing operation . . . Residents expect a

well maintained facility It is the single most important aspect of a successful housing experience to resident students and their parents.

It is little wonder, therefore, that housing and auxiliary enterprise administrations on many campuses are searching for a maintenance structure that will provide better and more timely maintenance.

The maintenance structure recommended by the Association of College and University Housing Officers-International (ACUHO-I) is an organizational structure placing administration, maintenance, food service, and educational programming all under one housing administrator (Fredericksen, 1983). Such a structure gives control of maintenance in residence halls, apartment complexes, and food service areas to the housing office, rather than to the university physical plant department. Many campuses, however, have housing organizations that, for one reason or another, have not implemented such a structure.

Fredericksen (1983) expands on the idea of a maintenance staff dedicated to housing in the following passage:

A maintenance staff dedicated to housing is needed because of conflicts in institutional priorities The maintenance needs in a residential setting should not compete with maintenance needs in a classroom, lab, or office. They are not compatible when priority setting and response time considerations are made. Independent staffs should be available to respond to independently prioritized work requests.

These concerns are of such widespread importance that in January 1990, Charles Jankey, ACUHO-I liaison to APPA: The Association of Higher Education Facilities Officers, spoke at a special program cosponsored by ACUHO-I and APPA. The program was entitled "Facilities Management for Housing Administrators." In his speech, Jankey discussed the classic conflict between housing administrators and those who have the primary responsibility of maintaining and operating the physical plant. He observed that physical plant is often regarded as the enemy by those in housing, and vice versa. Since the areas of responsibility of physical plant and housing so often overlap, he feels that both are trapped in a no-win situation. In his words,

Facilities managers . . . are more inclined to think about how people and events impact buildings and the landscape rather than how those things impact people We [housing officers], generally, are more inclined to think about the physical plant as places for people As extraordinary wear and tear and/or damage occurs the response from one culture will be to address "the problem" with more severe and unyielding design, while the other will be inclined to look for a better balance between habitability and maintainability. The potential for conflict between these closely related cultures is enormous and continuous."

This classic conflict between physical plant and housing administrators has led to a desire on the part of many housing officers to decentralize the maintenance function, giving housing administrators control of their own maintenance operations. This, in turn, has led to discussion among housing professionals (indeed among professionals in many fields) as to whether centralized or decentralized systems operate more effectively.

Peters and Austin discuss this issue in their book, *A Passion for Excellence* (1985). They state that while the myth is that it takes a big, centralized team to attack and quickly complete a complex project, the truth is that small teams can often accomplish the lion's share of even the most complex task in a fraction of the time that a large team takes.

In another book, *Thriving on Chaos* (1987), Peters mentions that smaller, decentralized organizations frequently feature well-trained and highly involved people who are more sensitive to the needs of their customers. Rather than focusing inflexibly on the slow, power-driven "vertical" decision making that characterizes large, centralized organizations, small, decentralized groups emphasize market-driven decision making and fast adaptation.

On the other hand, William D. Middleton, a leading authority in the field of university facilities management, argues for a centralized approach to overall facilities management. In an article published in *New Directions for Institutional Research* (Spring 1989), he divides facilities management into three areas: planning and acquisition, maintenance and operation, and assignment and utilization of facilities. Rather than taking a decentralized approach and assigning responsibility for these areas to separate departments—i.e., a facilities planning office, physical plant, and university administration—Middleton argues for a centralized organization headed by a broad-based facilities management professional.

In summary, the authors' review of the literature revealed a growing concern with residence hall maintenance and a diversity of opinions about how it can best be managed.

We discovered that the ACUHO-I Apartments Committee publishes a yearly Apartment Housing Survey that includes a listing of what percentage of facility/maintenance operations is accomplished by in-house maintenance personnel, university physical plant personnel, outside contractors, or others. However, no comprehensive study that included maintenance structures in residence halls was found, and the ACUHO-I Apartment Housing Survey included no discussion or analysis of the figures they listed. We concluded that, while information related to maintenance structures has been gathered and published in descriptive and percentage format by other researchers, no study similar to the one outlined below has been performed. Thus, we decided to develop a perspective from a university housing administrator's viewpoint while analyzing the results of a national survey of housing maintenance structures.

Purpose of the Study

The major purpose of this survey was to analyze the current maintenance structures at residential colleges and universities. The telephone survey instrument was directed to the key housing maintenance administrator at an ACUHO-I member institution from each of the fifty states. Directed to schools that house 3,000 or more students, the survey included questions about the structure of the campus maintenance operation and the level of satisfaction of the housing maintenance administrators with their maintenance structures. Of special interest was learning how many universities fell into each of the following three categories: 1) those who employ housing maintenance mechanics who work out of a central physical plant office; 2) those who use a decentralized approach to maintenance in which housing administrators hire and supervise their own maintenance mechanic personnel; and 3) those who use a variation of the two approaches or outside contractors.



Our research hypothesis was that there is a difference between state-supported universities who have housing maintenance performed by mechanics who work for housing administrators and those universities where housing maintenance is done by mechanics who work for physical plant.

Method

Population

The following list of criteria was established by the researchers:

1. Each state-supported university needed to have a housing enrollment of 3,000 or more.
2. Each university needed to have a total enrollment of 7,000 or more.

Sample Size

It was determined to select one university from each of the fifty states ($n = 50$), using the criteria described above. It should be noted that the instrument was developed by the researchers and has not undergone extensive reliability or validity estimates.

Selection

Each of the key maintenance administrators selected is listed in the 1990 ACUHO-I Directory. Information provided in the directory lists each institution's members by school, address, and phone number. The current year's total enrollment and housing enrollment for single males, single females, and apartment-living occupants is also included. All university administrators responsible for the housing operation are also listed. These include housing directors, associate and assistant directors, food service directors, apartment living directors, and directors of facilities maintenance. Of the fifty facilities maintenance directors who responded to the survey, the most frequently held title was associate director of housing, facilities maintenance (32); the next most common was superintendent of building maintenance (18). The mean total enrollment of the universities surveyed was 22,513, and the mean housing occupancy was 5,612.

Instrument

The authors used a standard questionnaire to ask key housing maintenance administrators at each university about the organization of the residence hall maintenance operation. The survey instrument presented each contact person with the following:

1. Which of the following best describes your maintenance operation?

- A. Residential life has its own maintenance personnel.
 - B. Work is completed exclusively by physical plant.
 - C. Combination of both.
2. What is the job title or classification of the maintenance personnel doing the work in the residence halls?
 3. How long has the university been using this system?
 4. Give a general statement on how this system is functioning.
 5. How do you feel having a housing maintenance operation compares to having a central physical plant operation?

Procedure

A single researcher telephoned each of the fifty subjects and administered the five-question instrument. Each call lasted an average of fifteen minutes. The responses to each question were entered into a questionnaire template developed by the researchers using the LOTUS 1-2-3 spreadsheet. This information was then downloaded to a text file for a statistical analysis using the SPSS/PC+ V 4.0.

Descriptive Results

Responses of housing administrators to question 1 indicated that only six of the fifty (12 percent) universities have centralized maintenance operations under total control of their campus physical plant departments. In the remaining 88 percent of the universities, residence hall building mechanics are under either full or partial control of the housing office. Thirty-five percent of the administrators surveyed indicated that their maintenance operation is totally decentralized with the housing office having full control of all residence hall maintenance and craft personnel. Fifty-three percent said that the physical plant and housing offices share in directing maintenance in the residence halls. In most cases where the housing office has partial control of the maintenance operation, the subjourney-level employees (generalists) work out of the housing office, and journey-level workers (specialists such as electricians, plumbers, carpenters, etc.) work out of the physical plant office.

In response to question 2, the most common job title for subjourney-level residence hall maintenance personnel is maintenance mechanic (13) with building maintenance mechanic (6) or maintenance person, man, or worker (5) also being common. In many cases a classification level such as I, II, III, etc., is added to the name. At larger schools, job titles reflect the specific craft of the journey-level workers (carpenter, plumber, etc.).

Administrators' answers to question 3 revealed that the universities surveyed have been using their current system of maintenance operation anywhere from one to sixty-two years, with twelve being the average. Some universities, notably Purdue and Kansas State University, have had their housing maintenance personnel working under the housing structure for many years (sixty-two and forty-eight years, respectively). Administrators at these universities report advantages such as cost savings due to direct control over budget and personnel, better communication, quicker response time, and more personalized service due to having maintenance personnel assigned permanently to specific halls where they get to know students and staff and are, therefore, more sensitive to their needs.

Other universities (among them the universities of Alabama, Alaska, Connecticut, Delaware, Georgia, Central Flori-

da, Illinois, Massachusetts, Missouri, Nebraska, Nevada/Reno, Oregon, and South Carolina) have changed within the last ten years to a system that gives either full or partial control of housing maintenance personnel to their housing offices. Housing administrators at these universities report such improvements in their overall operation as cost savings, increased quality control over the housing operation, a quicker response time, and more time for preventive maintenance.

Question 4 asked for a general statement on how the universities' current housing maintenance operations are functioning. Administrators at all eighteen (35 percent) of the schools using a maintenance operation in which the housing offices have direct control of their maintenance personnel expressed strong satisfaction with their current method of operation. Some of their comments were, "cost effective," "best situation anyone could have," "I wouldn't want it any other way," "many times better than with physical plant," "fantastic," "only way to get the work done," and, "working very, very well."



The twenty-seven (53 percent) who share control of the housing maintenance operation with physical plant typically have their own subjourney-level staff but use journey-level employees from the physical plant department. Administrators at these universities are generally satisfied with their method of operation, but most of them expressed a desire to have their own journey-level staff. Among their comments were, "difficulties when it comes to communicating with physical plant," "physical plant has different priorities," "housing wants more staff to do skilled work," and "not ideal."

Administrators at the six universities (12 percent) having a centralized maintenance operation where all housing maintenance is under the supervision of physical plant expressed the least satisfaction. "Working fairly well—there is a backlog," and "want own workers—too much politics involved in getting maintenance done" are representative of their comments.

In response to question 5, administrators at most universities mentioned several advantages to a decentralized system

with maintenance controlled by the housing office. The advantages are summarized below, ranked in descending order according to the frequency with which they were mentioned. The numbers in parentheses after each item indicate how many administrators named the item as an advantage. There were no responses listing any advantages of a centralized physical plant operation.

- Cost savings due to direct control over budget and staff assignments (31).
- Quicker response time (24).
- The ability to establish priorities and control priority work (21).
- The ability to establish standards and control quality of work (13).
- More responsive to students' needs (9).
- Improved communication between hall staff and the housing office (8).
- More pride and loyalty, resulting in higher quality work (6).
- More personalized service by assigning staff to a specific hall (5).
- Decreased workload on physical plant, freeing them for other projects (2).
- Reduced work load (1).
- Fewer people to deal with (1).
- Fewer bosses (1).
- Small turnover (1).
- Fewer callbacks (1).

Statistical Results

The authors' research hypothesis was that there is a difference between state-supported universities that have housing maintenance performed by mechanics who work for housing administrators and those universities where housing maintenance is done by mechanics who work for the physical plant department. The results have supported this hypothesis.

Discussion

The results of this survey support the contentions of Peters and Austin that bigger and centralized does not necessarily mean better; i.e., a maintenance operation that is decentralized seems to better meet the needs of most housing operations. The statistical analysis of the results, which examined only the relationship between university size and maintenance structures, also demonstrates that universities on most larger campuses nationwide are turning more and more to an independent housing maintenance operation. Universities with large housing operations are most apt to have total control of their maintenance operations because they are able to support not only general maintenance workers, but also journey-level crafts such as carpenters, plumbers, electricians, and painters. Other universities are turning to an organizational structure that has general maintenance personnel who work out of the housing office. When these workers need the assistance of a specialist such as a plumber or carpenter, these specialists are called in from a central physical plant office.

One reason why universities have experimented with different maintenance structures over the years is that both unionized and non-unionized shops usually work best under a highly structured operational organization. Since physical plant departments are typically among the most structured organizations on any campus, maintenance workers accustomed to punching time clocks and taking breaks at set times feel most comfortable working out of physical plant. Unfortunately, maintenance people working out of the physical plant

departments on large campuses cannot possibly develop a thorough knowledge of all campus buildings or a personal relationship with students and staff in the residence halls. Thus, this organizational structure fails to meet the needs of residential students.

In universities where the physical plant and housing offices share housing maintenance, a cooperative tone is mandatory. The first step is to identify areas where functions intersect. In the classic conflict between housing and physical plant, the danger is that both feel a need to control maintenance operations in those intersecting areas, and this need becomes more important than achieving the best results. Jankey (1990) feels that "words need to be purged that suggest adversarial relationships. Conflict, confrontation, encounter, and perhaps even control need to be thrown out. Replace them with communication, collaboration, cooperation, engagement, and, most important of all, education."

Other factors make housing having their own maintenance personnel more effective. One is that residence halls and apartment complexes are the only campus buildings that are occupied twenty-four hours a day. This makes prompt handling of maintenance emergencies a necessity at any hour. Second, many of the repairs needed in residence halls are minor, and some are the result of vandalism. Maintenance personnel who work out of a centralized plant tend to let these repairs go because they believe that other maintenance requests are more important and more deserving of prompt handling (Fisher, 1990). The result is that students resent the length of time that passes before repairs are made and may lose pride in their buildings, turning to more vandalism to "get even." Third, it is much easier to maintain inventories and supplies of materials that are used only in the residence halls, apartment complexes, and food service areas. Fourth, having maintenance personnel who wear uniforms and drive vehicles with a logo of the housing department helps the public recognize the comprehensive nature of residential life organizations (Fisher, 1990). Fifth, residence hall food service areas have specialized equipment to which housing maintenance mechanics can be assigned. These people can be given special training to maintain and repair this equipment. Thousands of students depend on residence hall food service areas to provide meals seven days a week. Clearly, universities cannot afford to have the equipment that makes this possible on "standby service."

The survey results reveal that over one-half of the schools using a residence maintenance structure either fully or partially controlled by housing administrators have changed to that structure within the past ten years. These results demonstrate that large residential campuses are moving away from physical plant control of maintenance.

Schools with very large resident enrollments, such as the University of Maryland at College Park or the University of Michigan, have housing facilities offices that maintain full control of all maintenance, including journey-level employees such as painters, locksmiths, and electricians. The University of Illinois hires journey-level workers from physical plant. These journey-level employees then report daily to specific residence hall complexes where they are given their work assignments by a building inspector who works for residential life. The housing office at the University of Illinois also employs some of its own journey-level craft people.

It is clear that the maintenance needs of buildings in which people live are different from the needs of academic facilities or administrative buildings. It follows, then, for housing offi-

cials to have direct control of subjourney and journey-level maintenance mechanics who provide services for residential housing. During the past decade, large residential campuses have moved away from a centralized maintenance operation to decentralized maintenance control.

Today's students pay increased costs for room and board. These rising costs influence students to expect their rooms and apartments to be well-maintained and attractive. Residents also set high standards for the food they are served and for the cleanliness and convenience of areas such as dining centers, computer labs, and fitness rooms. As universities become more competitive for students, housing officials across the country come to view resident students as customers paying for well-maintained living conditions that include comfort, security, and a mentally stimulating environment. It is this current relationship between students and housing officials that sponsors the ideology that has been confirmed by this study: if the housing office has a direct effect on the individuals it serves, it should have direct control of the maintenance operation.

References

- APPA, National Association of College and University Business Officers, and Coopers & Lybrand. (1989). *The Decaying American Campus: A Ticking Time Bomb*. Alexandria, VA: APPA.
- Fisher, Roger. (1990, August). Unpublished letter to Floyd Hoeltel from the Director of the Department of Residential Life at the University of Missouri-Columbia.
- Frederiksen, Charles F. (1983, March). Unpublished Evaluation Report of Organizational Structure of Residential Life and Physical Plant Concerning Maintenance and Janitorial Services in Residence Halls at Illinois State University, Normal-Bloomington, Illinois.
- Jankey, Charles. (1989). In the program for APPA's Institute for Facilities Management held January 7-12 in Tempe, Arizona.
- Jankey, Charles. (1990, January). Text of a speech given at a special program entitled "Facilities Management for Housing Administrators" jointly sponsored by ACUHO-I and APPA in Tempe, Arizona.
- Middleton, William D. (1989, Spring). "Comprehensive Facilities Management." *New Directions for Institutional Research*, pp. 77-88.
- Peters, Tom and Austin, Nancy. (1985). *A Passion for Excellence*. New York: Random House.
- Peters, Tom. (1987). *Thriving on Chaos*. New York: Random House.
- Saunders, Laura E. (1989, Spring). "The Politics of Budgeting for Deferred Maintenance." *New Directions for Institutional Research*, pp. 5-12.

For further information or for a chart providing information about the universities surveyed and a detailed summary of their responses to the first three questions of the survey, contact the authors at Illinois State University. ■

Comments

We invite your comments on this and any other article in *Facilities Manager*. Please write to: Editor, *Facilities Manager*, APPA, 1446 Duke Street, Alexandria, Virginia 22314-3492.

YOU NEED A SUPPLIER
who is *aware of your*
changing needs in
security hardware...



ONE WHO HAS THAT HARDWARE
in stock for *immediate*
delivery from three
convenient locations...



AND WHO HAS THE PEOPLE
with *technical expertise*
and *product knowledge*
who are committed to
solving your problems...



YOU NEED DUGMORE & DUNCAN!

In the East: 800-225-1595 In the West: 800-325-1595 In the South: 800-232-1595



**DUGMORE
& DUNCAN™**
Established 1897

The largest stocking distributor of **SARGENT®** lock products in the world.
We also stock Yale, Don Jo, Simplex and others.

REORGANIZING FOR ZONE MANAGEMENT

by Kenneth A. Hall

Are you dissatisfied with your maintenance response time? The condition of your maintenance fleet and equipment? Have you been observing four craftspeople traveling in one vehicle? Or the lack of identification of your craftspeople with the concerns of the customers? Or are you tainted with the image of physical plant being too slow and costing too much?

Are you tired of having to respond to the campus joke, "What's white and sleeps four? A physical plant maintenance van."

If these concerns or others like them are prevalent on your campus, then maybe the following information can help you as much as it has helped us at the University of Idaho. This article is a collection of observations and accounting of events that occurred within the facilities management division at the University of Idaho within a twelve-month period.

Furthermore, you will read about a solution to the above referenced situations and the processes we went through to get to that solution. I was dissatisfied with our current situation; I perceived a need for change; I had a vision of the way I wanted to operate; I solidified my vision into a practi-

cal and achievable concept; and I challenged my staff to make the changes without creating either a revolution or a catastrophe.

This article's primary purpose is to stimulate you to reflect upon the way you and your organization deliver your services and to confirm that if you have an inspirational, overall goal for your unit. You and your staff can make anything happen if you believe strongly enough.

The secondary purpose of this article is to provide you with some of the tools and concepts that could make it easier to bring about desired changes within your organization or unit. My staff and I used these concepts to accomplish a major reorganization in a very short period of time.

How did this great, grand, and glorious scheme come about, and from where? First, let me set the stage for those of you not familiar with Idaho, the university, and facilities management.

The State of Idaho

Located in the Pacific Northwest, Idaho has a population of slightly more than one million people. The economy is based upon agriculture, lumber, mining, and recreation. The state is essentially rural with large sections in the middle of the state designated as wilderness area.

The University of Idaho

The University of Idaho resides in Moscow, the eighth largest city in Idaho, located in the panhandle of the state, with a population of 18,000. The student population of the campus is 9,250. The university is a 100-year-old land-grant institution assigned the primary research mission of the state. There are nine colleges on the campus and no medical college. The veterinary science and medical science units are directly affiliated with the two largest institutions in Washington State.

Facilities Management

There are 2,149,681 gross square feet of space assigned to the responsibility of 200 facilities management employees. There are an additional 1,039,970 gross square feet of auxiliary space for the staff-provided support services. There are 169.3 acres of landscaped grounds and 1,200 acres of farm land immediately adjacent to the campus.

Facilities Management Organization As It Was

What promoted this reorganization? It all started with my annual budget presentation to the vice president and other members of the financial affairs staff in April 1989. While expressing my frustration with the constant budget and personnel cuts—with the increased demand to provide a higher level of service and to eliminate all complaints about physical plant performance—I provided the following challenge. If given the latitude and support, my staff and I could reorganize the physical plant division into a decentralized unit with the mission of providing better service within the existing budget.

The challenge was accepted by the vice president, with the proviso that we would have in place, by September 1, 1989, a zone unit fully functioning as a model. I said, "We could do it."

The following was the primary method of operations:

1. We did all maintenance and renovation work with craft-people from a centralized shop on a chargeback basis.
2. We were seeing funding levels at 95 percent of the previous year's base budget, particularly when inflation was factored in.
3. Our capital renewal and deferred maintenance program was getting further and further behind, to the point that the list exceeded \$89 million.
4. We were receiving no dollars for capital equipment.
5. Our operations were becoming inefficient, and criticism was growing over our inability to take care of the needs of the campus on a timely basis.
6. The physical size of the shops and the adequacy of equipment created problems for safe and efficient operations.
7. The number of vehicles needed to efficiently transport crews around campus was greater than the current level of funding would provide. In addition, many of the vehicles in use at the time were in various states of disrepair.
8. With the location of the central shops on the north side of campus and with the limited use of closed streets, many of the crews had to respond to maintenance calls in a circuitous route.
9. At the time, most maintenance work was conducted on an as-needed basis.
10. Interdepartmental relations needed to be improved.
11. Career tracking and advancement within the system was extremely limited.
12. Ratio of projects versus maintenance work fluctuated, causing variations in staffing patterns.
13. Physical plant identification with a building or department problem or need was lacking with the present method of assignments.
14. Level of funding prohibited fixing problems correctly; "just patch jobs to sustain operations."

The Initial Vision

If there is not a clear overall purpose from above that you can hook into, it is all the more reason to come up with your own purpose and vision.

These were the basic assumptions I had to test for:

1. Where were we going with our organization?
2. What was our purpose?
3. What mission were we pursuing?
4. Were these things clear to the entire staff/university?
5. Were they shared and understood throughout the organization?
6. Do people come to work with enthusiasm?
7. Do they believe in what they are doing?

The Realities of the Situation

We were doing more with less, and we were going to have to do even more with even less; all of which was going to affect productivity, cost, quality, and schedules. The quality of work life (commitment, morale, meaning) were all being affected with constant budget cutbacks. Responsiveness (adaptability, client relations, and technology) were impairing our interface with the institutional departments.

Thus, the situation boiled down to—What could I live with and what could the organization live with?

Henceforth, the zone management concept came about: "Getting service to the level of people-helping-people." Putting the decision-making process with responsibility and authority at the lowest possible level in the organization seemed to be the most appropriate way to venture.

Zone Implementation Team

I gathered together what data I had collected over the years of attending APPA meetings and reading professional journals. I focused on the concepts developed at the University of Missouri, University of Alberta, Canada, and University of Colorado. I talked with these administrators and I visited the University of Colorado. With the insight gained from these people sharing their triumphs and shortcomings, I began by putting together a feasibility study team.

The Feasibility Study Team consisted of our assistant director for shops operations, assistant director for building maintenance and operations, supervisor of building managers, and assistant director for grounds maintenance.

As a footnote, I need to share with you the fact that we had already been flirting with some zoning concepts. The first phase was implementation of the building managers program

Figure 1: Zone Map

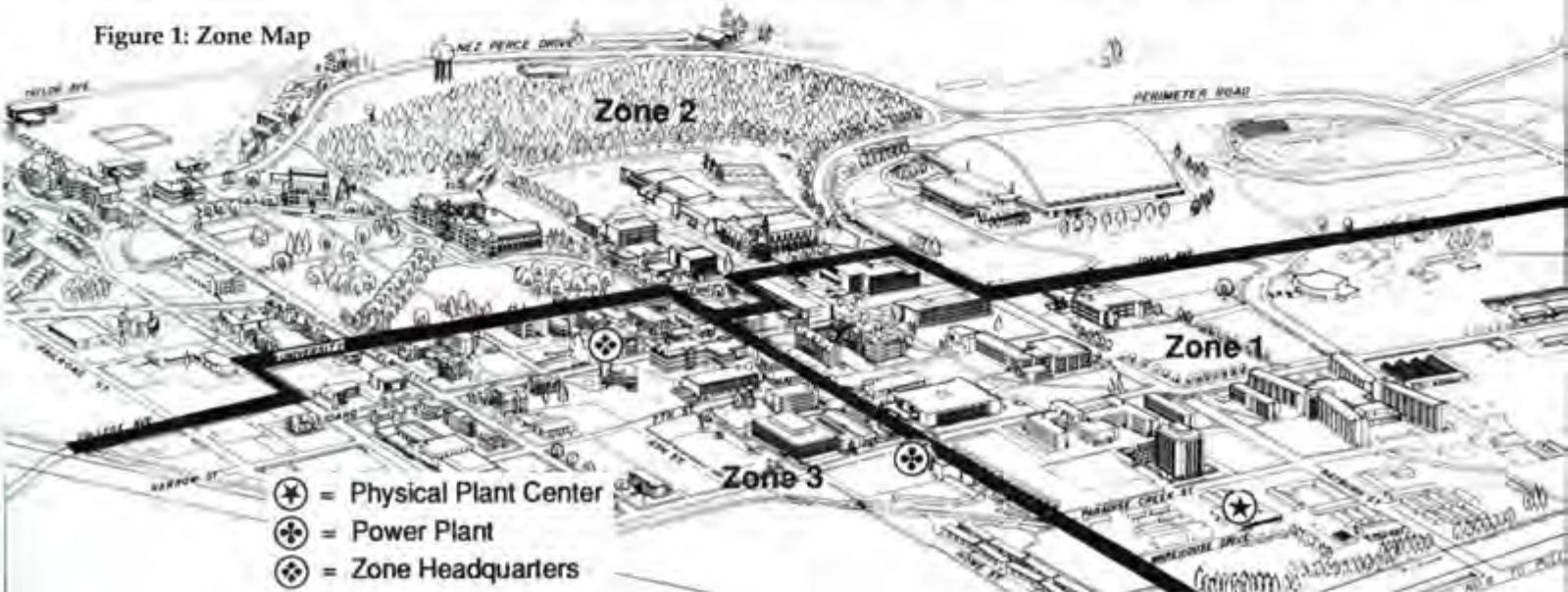
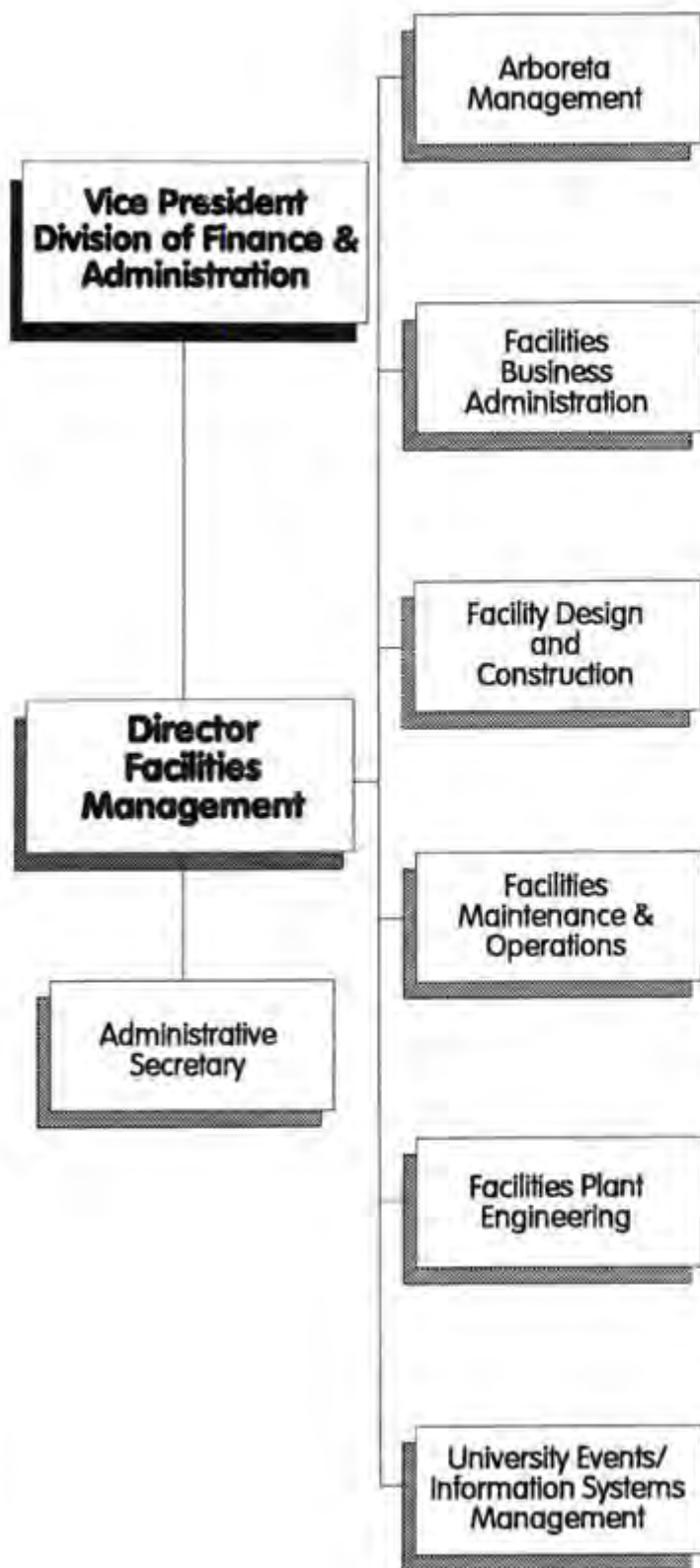


Figure 2: Current Organizational Chart



in 1985; the second phase was assignment of grounds tasks by areas in 1986; and the third phase was interfacing the building managers zones with custodial areas in 1988. So the zoning concept was not a totally foreign idea to some of our staff members.

Introduction of Fourth Phase Team

Members of the task force for the development of the Zone Management Program came from the assistant directors and superintendents. We also went several steps further; we invited a member of the budget office and the associate director of human resources office to be a part of the task force. Furthermore, we asked the elected staff representatives from facilities management to be active participants in the task force meetings. Even though this made for a large group, it helped the communication process—both ways.

We met as a team every Wednesday from 9:00 a.m. to 11:00 a.m., starting in May and ending in October. We never missed a Wednesday. Subcommittee meetings were held at other times, and we had numerous sub-groups meeting. We also developed several program checkpoints.

Task Force Goal

The goal developed by the task force was that we would anticipate phasing in the Zone Management Program beginning September 1989, with the intentions of better utilizing the current physical plant staff and facilities, providing quicker service to the building users, completing more maintenance work, and accomplishing these tasks within the number of employees and dollars currently available.

Objectives of Zone Management

The organization of facilities management would reflect the zone orientation in the delivery of services in custodial, grounds, and building maintenance.

The campus would be divided into four zones; three would handle general education funded buildings, and the fourth zone would be responsible for all auxiliary facilities.

Zone shop space would be centrally located within the zone so these maintenance crews could respond to their work assignments within an easy walking distance.

Several "maintenance craftspeople and trades persons" would be assigned to a specific group of buildings. The buildings were grouped in close proximity with the common characteristics of departmental functions, building operations, and within walking distance. Installation of a building maintenance software program would need to be installed and utilized as the major facet of scheduling all maintenance work.

Interface with Existing Programs

1. The building managers would continue to be a vital link in the process of identifying building user needs and communications with facilities management.
2. The shops operations would continue to perform on a charge-back basis for all work performed in each of the zones, as well as normal project work.
3. Conceptually, the shops operations would handle all maintenance work that required more than four staff hours and would do all capital project work up to \$100,000. (These two units of measure are general guidelines and individual situations would arise where decisions are made on a case-by-case basis.)

Zone Map (see Figure 1)

1. Building managers areas.
2. Grounds areas.
3. Custodial areas.
4. Shops areas.

Zone Organization Chart

1. Evolution of current chart.
2. Current chart (See Figure 2).

Zone Task Chart

1. Task development process.
2. Current task chart (See Figure 3).

Implementation Schedule

The task force developed a schedule of activities to address the facets associated with the change process. The following fourteen-point outline reflects the major elements of the implementation schedule.

1. Objectives.
2. Policy and procedures.
3. Develop task and flow charts.
4. Design organization flow chart.
5. Zone area maps developed.
6. Scope of work for each shop/zone.
7. Maintenance management program.
8. Personnel selection/assignments.
9. Physical resources.
10. Accounting/budgeting.
11. Communication systems.
12. Quality control systems.
13. Public relations/orientations.
14. Implementation
 - A. Personnel assignments
 1. Managers and supervisors
 2. Key technician positions
 3. Fill other vacancies
 4. Area assignments
 - B. Area work stations
 - C. Equipment and tools
 - D. Maintenance management system
 - E. Construction management system

Pay Grade Chart

We developed a comprehensive matrix to chart all of the salaries and job descriptions within the revised program. This information was revised weekly as the organization began to be molded into a different shape.

Point Factored Jobs/Salary Ranges

Each of the new as well as the current job categories were placed in the new organization. This allowed us to see if we were covering all of the identified tasks we wanted within each of the different departments. Then we began the process of putting dollar values and time (FTE) associations with each of these jobs.

From this we were able to develop a distribution of salary ranges for each job category. This also began to demonstrate to the employees where career pathing could allow them to move within the organization. It also began to give the task force a handle on the total dollars needed to fund all of the positions for the reorganization.

Job Announcements

The announcements of the open positions were limited to

current University of Idaho employees. We did not advertise off campus. We published a list of all open positions and their scheduled closing dates. This list was then given to all current employees of facilities management as well as listed in our university employee newsletter.

Application Procedures

Our procedures for new jobs were very upfront and designed to give everyone a fair chance to compete for any opening announced. We also provided training for individuals in writing resumes and how to conduct themselves in job interviews.

All of the selection committees were appointed by me as the director of facilities management; however, all nominations came from the task force. All of the chairpersons of the selection committees were from outside facilities management. We also made sure that 30 percent of the committee membership was made up of individuals outside facilities management. Furthermore, at least one person on the committee was from the local community, representing the focus of the profession in the committee's search.

All of the interviews were conducted in accordance with the guidelines of the Affirmative Action Office. The only exception was the limitation of the recruitment area. I encouraged all of the staff to look for individuals who were strong in human relations skills and asked them to apply for lead positions. I personally stayed out of the recruitment aspect. Numerous individuals asked me to advise them on what positions they should apply for. I refused to make any statements that could appear biased toward any one individual. This seemed to provide the spirit of fairness that we all thought was so essential for success of the recruitment of the best person for each position.

Application Form

We used the standard application forms from the human resources office. We allowed each person to attach one additional sheet for supplemental information. We had a standing rule that the office secretaries could not be used to type applications or supplemental forms. No one was to get an advantage.

Facilities Management Implementation of Goals

We anticipated phasing-in the Zone Management Program beginning July 1989, with the intentions of better utilizing the current facilities management staff and facilities, providing quicker service to the building users, completing more maintenance work, and accomplishing these tasks within the number of employees and dollars currently being made available.

Concept Details

1. Some of the benefits of Zone Maintenance Program
 - Handling routine tasks with lower skill level personnel.
 - Better familiarity with the building systems, especially HVAC.
 - Building checked every day, some more often as needed.
 - Work orders responded to in a timely fashion and performed by someone who has a close working relationship with the individual making the request; quicker handling and fewer phone calls.
 - Better follow-up; users know the status of their requests.
 - Sense of pride and some competitiveness between various zones.
 - Accountability; easier to assess.
 - More efficiency; less travel time.

- Eliminates the "revolving door" image.
- Allows craft shops to concentrate on major and/or critical projects.
- Good PR for facilities management; essential to overall morale improvement.
- More maintenance work accomplished.

2. Developmental Steps

These steps needed continued refinement during the implementation and created some problems.

- Identifying key persons to be responsible for implementation.
- Defining scope of work to be handled by zones.
- Modifying pilot program.
- Recruiting qualified personnel for zones.
- Refining relationships between zone personnel and central shops personnel.
- Transferring work orders to zones and central shops.
- Defining and assigning task for detailed implementation.

Impact Analysis

The task force developed an impact analysis in an attempt to identify the potential problem areas and their positive aspects. This list comprised the basic assumptions we came up with and how we proposed to handle the different scenarios.

1. Staffing

The total number of facilities management classified employees stayed the same, but we needed about twenty additional positions. We had historically been hiring part-time people far exceeding the full-time equivalence of thirty positions. But we had been given the directive to staff within budget.

We needed to reclassify several positions and reorganize the operational units to reflect new assignments. The task force identified all of the various job descriptions needed to make the Zone Management Program workable, then matched those identified positions with existing positions. We had a good match on most; but we still had to write or rewrite forty-two different job descriptions.

2. Morale

With the change of environment and peer groups, procedures, and responsibilities, morale should improve, but we were concerned about the backlash from those who were afraid of change. Therefore, we developed a weekly bulletin and published minutes from the task force meetings. We also asked all of the task force members to meet weekly with an assigned group of staff members to give them updates and to solicit their input.

3. Adversity to Change

We expected some resistance to change, and we needed to plan on how best to handle the resistance. With proper orientation and involvement of the staff members in the development stages, most people here had a part in the success of the program. This assumption was coupled with our strategy to handle morale problems. We also accepted that there would be some people who absolutely could not handle the idea of change. We still wanted to make sure we kept those people in the loop to minimize the backlash.

4. Physical Location

There would be difficulty in finding space for the zones to work out of, as shop/office/locker. We anticipated the administration building would be adequate and no problem since space there was already assigned to facilities management.

However, the two other identified spaces would probably be more difficult. Morrill Hall and Brink Hall basements could be used for zone shop space. Each space would require 600 to 800 square feet of space with access to the exterior of the building. The problem was that they were assigned to other departments that were also pressed for space. The task was assigned to me to negotiate for the best possible situation.

I was able to convince the Brink Hall department chair that having facilities management in his building would help with response time to his building problems (of which there many) and facilities management would also remodel a storage room on the fourth floor into adequate computer lab space at no cost to him. He agreed and we moved in.

Morrill Hall posed to be a bigger obstacle. However, space in a building across the street became available, and it turned out to be better than our first choice.

5. Career Enhancements

This appears to be one of the more positive aspects of the program. By creating a series of maintenance mechanic positions (I, II, III, and IV), individuals could have the opportunity to advance in skills and develop a trade skill; maybe even become a journey-level performer.

6. Job Security

We anticipated that all personnel currently employed could and would be utilized in the new configurations. Some would be doing jobs other than currently assigned. Attrition would be the basis from which new skills could be added and open internal competition would be utilized before outside persons would be recruited.

In one of our bulletins I made a written statement to all of our staff members that *no one* would be without a job and *no one* would be forced to take a pay cut. This seemed to relieve the anxiety of several who could see that their jobs were being eliminated or rewritten, and thinking that someone would be more qualified than they were.

7. Retraining Program

We also came to realize that training was essential for the success of the program. An aggressive program to ensure that each person was familiar with their responsibilities would be necessary to operate the program with minimal supervision.

8. Impact on Delivery of Service

An electronic system of scheduling and monitoring maintenance programs was required for the zone program to function effectively. We have the software program developed, but needed the hardware and the staff time to implement.

Facility audits needed to be conducted to determine the current conditions of each building. With this knowledge we determined priorities and monitor progress and success of the zone program.

Budget Impact

Capital Outlay Impact

An assessment of fiscal impact as developed. We discovered we could incorporate changes, but we still needed some funding of capital items.

Equipment/Tools

1. Mostly hand tools and small power tools will be needed in each of the three zones.
2. One van and three electric/gas carts would be utilized in each of the three zones.
3. There currently are enough radios in facilities manage-

Figure 3: Current Task Chart

ZONE MAINTENANCE REPORTS						
Maintenance Work Orders and Responses Service Calls F.Y. 1990						
	Electrical	Carpentry	Plumbing	Painting	Other*	Total
Zone 1	361	149	240	105	486	1,341
Zone 2	259	131	179	114	182	865
Zone 3	1,567	80	104	26	213	1,990
Totals	2,187	360	523	245	881	4,196

*Indicates HVAC, Filter Tech, and Maintenance Mechanic service calls.

In addition to the above corrective maintenance, weekly preventive maintenance performed in all zones included:

- Testing of emergency generator testing.
 - Checking water softener.
 - Indoor air quality checking in certain buildings.
- Other preventive maintenance duties that were performed by the zones were:
- Back-flushing water system filters.

- Re-lamping each building on a five cycle.
- Exterior and interior window washing.
- Reverse Osmosis and Deionized water system testing.
- Servicing and checking fan motors, filters, compressors, vacuums, circulating and sump pumps.
- Generating hundreds of internal work orders in all of the trades, including unreported calls.
- Daily calling and monthly checking made by HVAC Control Technicians and Filter Technicians.

ment inventory; there would be a need to only take care of replacements.

Work Space Remodel

1. There will be a need to develop zone shop space in the three zones and to provide some tools in these locations.

Computer Tie-in

1. Each of the three zones will need to be hard-wired to facilities management's LAN and to computer services' mainframe.
2. An IBM-PC with IRMA board will be needed in two zone locations.

One-Time Cost (Other than Capital Outlay)

1. Training—this can be done in-house with existing crews.
2. Implement software—cost associated with clerical staff need to input the gathered data.

Summary

In summary, let me reiterate several points. In September 1989, the facilities management division of the University of Idaho made a major change in the basic structure of its organization. The shift was made from a historically-based centralized system, to an innovative, contemporary method of decentralized management. There were many reasons for this change, but the driving forces came from two primary directions: 1) the continued reduction of real dollars for physical plant maintenance and operations, and 2) the dissatisfaction of employees with their jobs and the lack of impact they were having on the management of physical plant.

With these thoughts in mind, we set about to implement a system that would maximize every dollar allocated to our division. We also wanted to create a system that would put the emphasis on serving our customers. Forty-seven new job ti-

tles were created and filled. Four zones of service were created with full responsibility to meet the needs of the customers in a timely fashion. Greater emphasis was shifted to maintaining the campus systems. More dollars were shifted to custodial and maintenance mechanic services to obtain a more effective level of service.

All of this was accomplished without one person being unemployed. Furthermore, all of this was done within the budget allocated for the fiscal year. There was been a net gain of twenty full-time positions by shifting assignments and dollars from irregular help to full-time, board-appointed positions. Several positions were upgraded and given more management and supervisory responsibilities. Career tracks and backup positions were created to develop continuity within the organization. Paperwork and procedures were minimized wherever possible. The entire process evolved around empowerment of the managers and the departments and the supervisors of the crews to make appropriate decisions that were in the best interest of the university.

After watching and participating in this evolutionary process, I am excited to have been a part of it. The whole spectrum has brought about a renewed focus of energy for the employees of facilities management. More people are now actively involved in the day-to-day operations of the university. The buildings look and operate better than they have in a long time. People are finding ways to express their creativity and energy in a positive manner.

All in all, this year-long (and still ongoing) effort has been fun and successful. There are many more facets to polish before this diamond is ready for a full review. The next several years will be marked with finetuning and sculpting to make facilities management truly a place where people gather together to help other people. The effort thus far has been extremely rewarding for many of us. ■

APPA Answers

Maxine Mauldin

ANSWERING YOUR CALLS, LETTERS, AND FAXES

The phone is ringing, and it's time to answer your Information Services questions as quickly and accurately as possible. I receive more than 70 percent of all incoming inquiries over the phone. APPA's Information Services hotline number, 703/684-4338, is a quick and easy way to ensure

that your request is being handled promptly.

There may be times when you need an answer right away. In situations like this, we try to answer your questions over the phone; APPA response time for requests is usually three to four working days. During that time, programs are written, depending on your request; copies are made of printed material, such as Institute papers; research is done on other companies or association that may be of some help; and of course, our own books, *APPA Newsletter*, and *Facilities Manager* are scanned for more information.

Faxing is another great way to send us your request. Ten percent of the inquiries are faxed. APPA's fax number is 703/549-2772. Your reply can be faxed back to you as well, but this depends upon the number of pages in the response. Some printouts from the International Experience Exchange data base can run up to twenty pages. We try to shorten these printouts by programming them for institutions near you, for instance, or institutions of your

FTE, unless you request the full printout. Because we are responding with the printout in addition to Institute papers, *APPA Newsletter* and *Facilities Manager* articles, publication listings, and other sources if any, we must limit the number of pages we can fax.

E-Mail is a new and fast-growing method to send in requests. Five percent of the inquiries are received by Steve Glazner, director of communications, on APPA's Bitnet. APPA's Bitnet address is <APPA@BITNIC.BITNET>.

The other 5 percent we receive are written requests sent through the regular mail.

The Information Services Committee also provides input into this department. The committee is always working on new and more useful ways to utilize APPA's resources to better serve you as APPA members. The committee meets once or twice a year to develop and disseminate the data and information relevant to higher education facilities management. George T. Preston, Art Institute of Chicago (IL), is the 1992-93 Vice President for Information Services.

Your input is valuable to us and helps us ensure the quality of resources and service. When you receive a response to your Information Services request, please take a moment to fill out our reply card.

If there is a topic you would like to see addressed in the next International Experience Exchange survey, please write me at APPA, Information Services Department, 1446 Duke Street, Alexandria, Virginia 22314-3492. If we receive a lot of requests for the same topic, we can use it. Thank you! ■

Maxine Mauldin is APPA's information services manager.

Information Services Comment Card

Please take a moment to fill out this card. Your input is valuable to us and helps us to ensure the quality of resources and service.

Date _____

What was the topic of your request? _____

Was this your first contact with Information Services? ☐ Yes ☐ No

If not, approximately how many times have you used Information Services? _____

Please rate the quality of the resources received to answer your request.

☐ Excellent ☐ Good ☐ Fair ☐ Poor

Please rate the quality of service you received from Information Services.

☐ Excellent ☐ Good ☐ Fair ☐ Poor

How long did it take to receive our response? _____ day(s)

Comments/Suggestions: _____

Optional (name) _____

(title) _____

(institution) _____

Thank you

Global Exchange

Noppadon Muangkroot

ASIAN INSTITUTE OF TECHNOLOGY

The institute originated in 1959, as SEATO Graduate School to help meet the growing need for advanced engineering education in Asia. In November 1967, the school changed its name to the Asian Institute of Technology (AIT). The institute became an autonomous, international institution empowered to award degrees and diplomas.

The institute's 400-acre campus is forty-two kilometers north of Bangkok, Thailand. Here more than 1,000 students, mostly from Asia, and 200 faculty and international staff, foster advanced technological learning to meet the regional need for more and better trained personnel for key positions in private and public sectors.

The institute's academic programs focus on the problems of the region and their engineering, scientific, and management solutions. Advanced education in engineering, science, planning, and management is provided through a range of activities at levels and intensities from doctoral research to short-term training.

AIT offers academic programs leading to master's or doctoral degrees and the diploma or certificates; research work by students, faculty, or research staff; and special programs, conferences, seminars, and short courses.

The doctoral degree lasts six or seven terms; the master degree, five terms; and the diploma, two or three terms. A certificate program normally lasts one term.

Noppadon Muangkroot is director, physical plant, at the Asian Institute of Technology in Pathumthani, Thailand.



The institute is supported by donor governments, foundations, international agencies, business organizations, and individuals—Asian and non-Asian. This support acknowledges AIT's successful international academic endeavor; an endeavor recognized by several international awards, including, in its thirtieth anniversary year (1989) the Ramon Magsaysay award for international understanding.

The campus was constructed at the present area in 1971. It was formerly situated in the Bangkok metropolitan area. Since then, the campus has grown steadily, including the academic buildings, housing dormitories, and faculty houses. At present, there are seven academic buildings, one central administration building, and ten buildings used as supporting units and research centers. Housing has 111 buildings consisting of more than 1,200 units and a campus hotel with two buildings of 100 rooms.

The institute's primary type of construction is reinforced concrete buildings. Due to easy availability of land, AIT adopts the open-planning concept where buildings are built without space constraints. There are twenty academic and research support centers and more than 100 buildings for housing units.

The primary source of energy for the campus is electricity, almost 100 per

cent. The campus has an energy technology division specializing in three special fields of study. Namely, renewable sources of energy, policy, and rational use of energy.

Our climate is the cause of many major facilities efforts. The climate in this region can be classified as tropical rainforest consisting of three seasons: hot, cold, and rainy. The temperatures sometime rise as high as 40°C with humidity of 80 to 90 percent.

The hot temperatures cause severe problems for our energy conservation program, particularly the central air conditioning system. The demand in the hot season exerts tremendous demands on the four chillers (300 tons each). An additional 500-ton chiller currently is being installed. Furthermore, the problem is aggravated by the open planning concept.

The seasonal rainfall sometimes goes as high as more than 200 millimeters a day, as in October 1990, causing terrible floods. Due to the geographical location of Bangkok near the delta of Chao Phraya River, it took some time before the flood water subsided.

Our flood control system, or more generally the water level control, has a two-way operation systems. One way is to pump the excess water out from the campus; the other is to store up the water level in the campus to be used



during the dry season by means of siphon. This water is also used for watering the nine-hole golf course and general landscaping. For this purpose the campus is surrounded by a perimeter bund.

The entire staff consists of 121 permanent staff and eighty temporary daily-hire laborers to assist with the ongoing projects. In addition, janitorial and housekeeping, pest control, and garbage services are handled by external contractors. The chief administrator of this facility unit is the director of physical plant assisted by an operation engineer, an instrumentation manager, a civil engineer, a system engineer, and a housing and accommodation supervisor. This unit falls under the jurisdiction of the AIT bursar within the central administration.

The role of physical plant of AIT is to ensure the proper and efficient functioning of all campus activities. The basic functions involve both the direct and indirect operation and maintenance of facilities and utilities that are of common use to the entire AIT community.

The physical plant's primary areas of responsibility are as follows:

Operations and Maintenance of Campus

- Electrical network
- Central air conditioning plant and individual units

- Flood control system
- Water supply
- Central sewage system
- Campus landscaping
- Building maintenance and renovation work

Providing Campus Services

- Housing and accommodation
- Contractor services — pest control and janitorial
- Telecommunication services
- Motor pool
- Labor pool
- Golf course and sports fields
- Central store and inventory
- Campus cafeteria

Providing Support Services to Academic Activities

- Instrumentation unit — design, fabrication, and repair of electronic equipment.
- Drafting unit — faculty report and poster makeup for conferences and seminars.
- Workshop — machine/equipment fabrication for student theses/dissertations and faculty research.

My primary concerns as a facilities manager are as follows:

- *Land subsidence* — almost the whole region of Bangkok is situated only one-half to one meter above sea level. Due to extensive underground water pumping for industrial and agricultural purposes, massive land subsidence is oc-

curing at the rate of two to ten centimeters per year. The rate is about five centimeters per year in AIT. The sinking ground causes quite extensive damage to buildings that do not have sufficient piling foundation. In fact, most buildings must be supported by seventeen-meter piles to prevent any soil subsidence problems. These caused the problems of cracked walkways, damage of corridor structure, broken water pipes, sewage blockage, and leaking roof problems. Extensive studies and research have been done in the geotechnical and transportation engineering division to overcome subsidence problems.

- *Energy conservation and air conditioning services.*

- *Water level control (flood and drought).*

- *Allocation of funds* — due to the nature of work and responsibility, there is a constant need to compete for limited funds to continuously upgrade our quality of service. Since the institute serves as a support unit, there is no di-



rect allocation in budget planning as given to academic units and research. Furthermore, the problems of upgrading and replacement are of vital concern. These are all necessary in order to maintain the reputation of AIT as one of the most prestigious technologically oriented institutions in this region. ■

Data Base Update

Howard Millman

CAPITAL ASSET MANAGEMENT HELPS YOU TRACK THE BIG BUCKS

Top notch leaders justifiably pride themselves on their long-range vision. Sometimes, however, they concentrate so intently on the far horizon that they run the risk of tripping over obstacles at their feet. Yes, it's a daily juggling act. They have to balance their time between strategic long-range planning while tending to the incessant day-to-day issues clamoring for their attention.

Facilities managers are swamped with maintenance management software programs (nearly 300 at my last count) to help them manage daily and scheduled maintenance, few truly long-term software solutions exist when it comes to managing the university's capital assets. This task of managing the hundreds of thousands of dollars committed for capital replacement and renewal is often relegated to the university's accounting software or an add-in module of maintenance management software. This is ironic, since capital usually outstrips maintenance expenditures by a factor of 10 each year. So to keep from falling on your own sword when it comes to tracking multiple capital maintenance projects, consider dedicated software that does that one job and does it well.

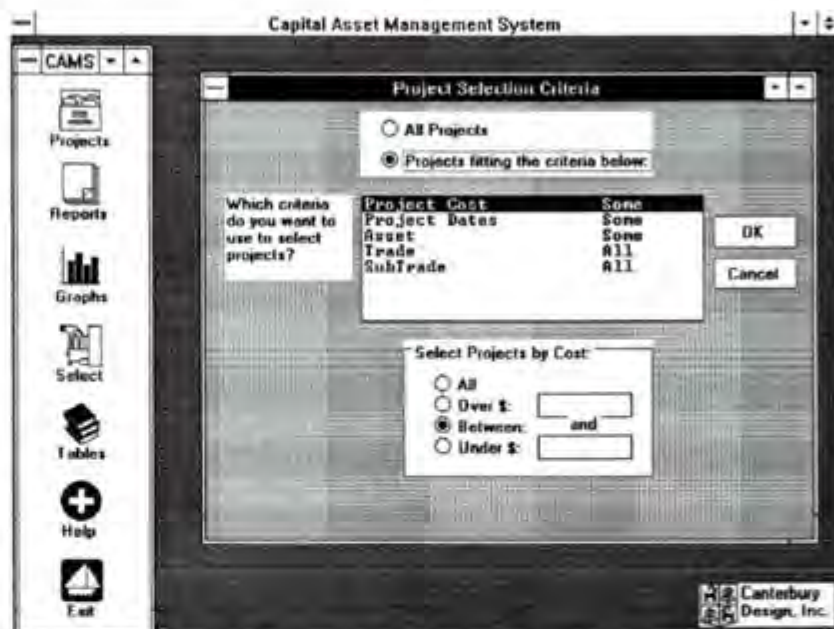
Canterbury Designs, a small innovative software house in Greenwich, Connecticut, has released a capital asset management system entitled, appropriately enough, CAMS.

Among its benefits is one that could make you a financial wizard. In addition to collecting all data about past and future capital projects into one search-

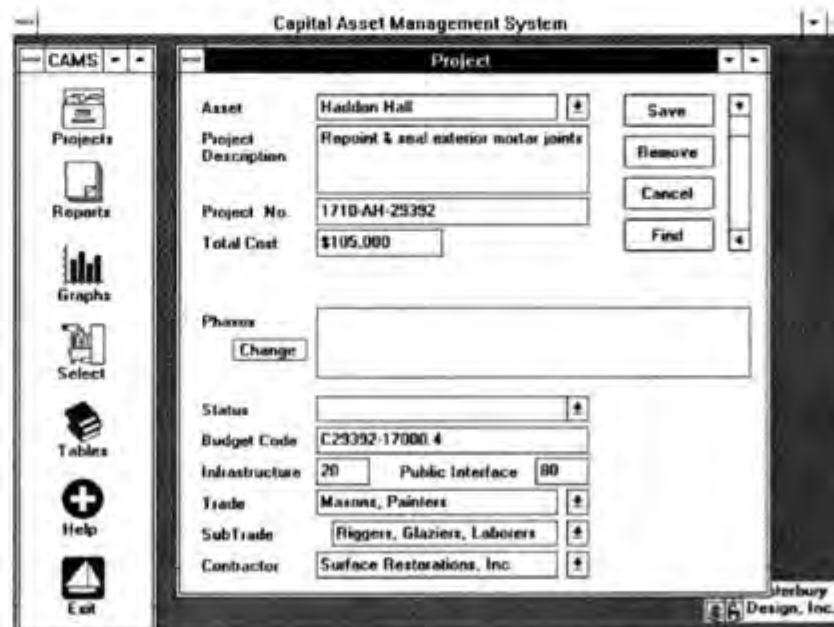
able data base, a dedicated capital asset management program will predict and level your cash flow. That one feature could enable the program to pay for itself within six months. How? When the university's investment counselors can closely monitor the cash outflow, they reduce the cash on hand and keep

more money invested in higher-yield instruments.

Kevin Tschudi, president of Canterbury, predicts that CAMS will help universities minimize surges in capital outflow while maximizing funds available for other uses. "Replacing, maintaining, and providing new capital assets de-



Search for specific projects or any other parameter by filling in the boxes.



Change the look of the project screen to suit your facility's requirements.

Howard Millman is a facility management consultant who provides support services for universities and hospitals planning to purchase, update, or install information management systems. He is based in Croton, New York.

mands a significant percentage of a university's resources," says Tschudi. "The ability to quantify anticipated capital maintenance needs will unquestionably help facility management professionals prepare clearly defined, complete, and readily accessible plans for the future."

Easy to Use and Understand

Running under Microsoft Windows on IBM and compatible computers, CAMS' fill-in-the-blanks approach en-

ables you to easily track past, pending, and future capital projects by the physical asset's description, history, location, and use. It tracks a ten-year time period forward or backward from any starting point on a moving base. It is subdivided into major building components and systems including shell, roof, electrical, plumbing, HVAC, and interior finishes.

Claiming that when one size fits all it does not fit any one right, Canterbury

says it will customize the software to meet the specific needs of a university. The firm contends that it is less expensive in the long run for the customer because they do not pay for features they don't use and that merely add to the complexity of software.

In addition, this initial degree of similarity will speed the program's acceptance and adoption by your staff. The similarity extends to using the same terminology and screen layouts that resemble existing, familiar-looking forms. That maximizes productivity and reduces ramp-up time. CAMS even personalizes its opening screen with your school's logo, colors, or insignia.

CAMS understands that what you want to do is track capital projects, not launch rockets, so it stores your information in a format that is understandable. Its easy-to-use "pick to click" graphic interface, on-line help, and icons invite all users to begin using it immediately. Instead of traditional menus, CAMS employs Windows' graphics to display choices as pictures instead of text. This makes it easy for users to move from projects, reports, and tables screens by clicking on their selection with the mouse. Each of these choices leads to a subsequent screen that provides for data entry or easy retrieval. Data is entered once, and CAMS distributes it throughout the related data bases.

Graphs Show More Than Words Tell

CAMS produces a variety of graphs and reports that you can readily customize to display only the information you need. Bar charts visually depict cash flow to aid in prediction and leveling capital disbursements. Data to build the graphs is automatically extracted from the data base sparing you from having to specify the ranges. One particularly timesaving feature allows you to click on any location on the cash flow graph and receive the dollar value encumbered for capital expenses on that day.

Although I have some reservations about Microsoft's Windows (especially its requirement for high-performance hardware), Windows is increasingly becoming the de facto standard in desktop computing by virtue of its enormous installed base. As a result, since CAMS runs under Windows, you can seamlessly share data with a wide variety of other programs to maximize and ensure a long life for your software investment.

For further information about CAMS, contact Canterbury Designs at 203/869-4531, or Frank Fiorentino Associates at 908/495-6200.

We've done our homework



And we're ready to be put to the test.

For over 80 years we've majored in providing high quality contract building maintenance services without the high cost. And we've learned how to do that by listening to our clients. People like you. Learning your needs. Studying ways to save you money. Analyzing costs, productivity and quality levels so well that some of our clients have saved as much as 20% compared to in-house programs.

Because we've done our homework, you'll find that our proposals are detailed, accurate, and meet the unique needs of your campus. ABM contracts (cleaning, engineering services, and ground care) all pass the test. Every time. On time. On budget.

Go ahead. Test us. Call today—**415-597-4500, Ext. 148**. Or write Robert Ramirez, Vice President, ABM College and University Division. He'll show why we're at the head of our class.



ABM
AMERICAN BUILDING
MAINTENANCE CO.

a subsidiary of
American Building
Maintenance Industries, Inc.

Robert Ramirez, Vice President
College & University Division
American Building Maintenance Co.
50 Fremont Street, Suite 2600
San Francisco, CA 94105-2230

The Bookshelf

Institutional Finances

Budgeting of Higher Education at the State Level: Enigma, Paradox, and Ritual, by Daniel T. Layzell & Jan W. Lyddon. Washington: ASHE/ERIC, 1990. \$17, softcover.

The current recession and continuing budget woes at the state level will mean lean times for higher education institutions as we compete with other state agencies for our share of a diminishing revenue stream. How effectively we compete for limited resources in the future will depend, to a great extent, on how clearly we understand the major focuses and factors at play in the state budgeting process.

In this timely report, the authors provide insight into the complexities of the budgetary process through the synthesis of relevant literature and recent research. As the authors suggest, the most important step in understanding the process is to increase our awareness of the state budgeting "big picture" for higher education. In other words, understanding why certain things happen may improve one's effectiveness in achieving objectives in the process.



While this monograph does not provide specific recommendations for practitioners in the field, it does accurately portray the complex interplay of environmental forces at work in the state higher education budget process including historical, political, economic, and demographic factors. The authors also highlight a number of issues that are having a fundamental impact on the quality of higher education today. Issues of performance, accountability, assessment, costs, and productivity are increasingly being used by states as indicators and mechanisms of change. Likewise, the budgetary implications of these issues affect the affordability of higher education, minority access, and the accommodation of nontraditional students. In addition, the potential use of higher education in economic development has become a major issue as states search for ways to retain and attract industry and business in order to compete in a global economy.

To financial and facilities practitioners involved at the institutional level in the state budgeting process, this book will prove to be a valuable resource. The authors have succeeded in not only simplifying many aspects of the budgeting process, but at the same time fairly representing the complexities of it—no small task. To higher education scholars, the authors identify gaps in the knowledge and areas where further research is needed.

As we move through the 1990s, it is becoming increasingly evident that higher education will be forced to do more with less. How we respond to these challenges could very well set the course of higher education for decades to come. Now, more than ever, it is critically important for us to know all we can about the budgeting process for higher education at the state level. This book is a starting point for practitioners and scholars alike.

This book is available from ASHE/ERIC, Higher Education Reports, The George Washington University, One Dupont Circle, Suite 630, Dept. ES, Washington, DC 20036-1181.

—David Techau

Associate Director, Facilities Planning and Development
University of Missouri System
Columbia, Missouri

Noise Control

Fundamentals of Noise Control Engineering, second edition, by Albert Thumann and Richard K. Miller. Lilburn, Georgia: Fairmont Press, Inc., 1990. 295 pp., hardcover.

Fundamentals of Noise Control Engineering presents a large amount of information in an understandable and retrievable format. The book includes a simulation exercise and extensive bibliography. It would be possible to use it as a source book to plan and follow the noise control aspects of new construction or a remodeling project. Information on alternative solutions and relative costs are included for various applications. The examples are primarily from industry but will be familiar to university physical plant personnel.

The text is readable considering the technical nature of the work. Explanations are understandable and self-supporting. The mathematical formulas are presented with clear keys to symbols and subequations. Supporting examples clarify the information presented. Graphic presentations provide an alternative perspective to the calculations. Tables and graphs with industry data on the effectiveness of various building materials and applications provide useful reference information.

Readers will be able to obtain increased assurance that a planned project includes the required sound attenuation considerations that will yield a facility fit for its intended use. Whether asking articulate

questions, or verifying the calculations and values provided by others, one more aspect of a successful project can be brought into focus. Common and obscure questions will be answered. How sound travels, how to account for multiple noise sources, calculation of cumulative environmental noise, calculation of cost per decibel of noise reduction, verification of compliance with OSHA and other agency noise limits, and new technologies of noise cancellation are among the subjects covered by the text.



The book is a good starting point for people who need to know more about noise control and the professional engineer who may be years away from the calculations and concepts. Prepare for an increased appreciation for the volume of information included in simple proposals. From the tried-and-true hang a blanket or rug on the wall to soak up the echo to generating 180 degree out-of-phase noise computer controlled to cancel unwanted sound, anyone can gain from thinking about the problems and solutions included.

My copy has already been requested for loan to the marine acoustics instructor.

This book is available from Fairmont Press, 700 Indian Trail, Lilburn, GA 30247.

—Kate Fenton

Fiscal Officer
University of Alaska/Fairbanks
Fairbanks, Alaska

Indoor Air Quality

Indoor Air Quality: Design Guide Book, ed. by P.E. Meckler. Lilburn, Georgia: Fairmont Press, 1991. 283 pp. \$62, hardcover.

Indoor Air Quality, according to the foreword, "is a consolidated book for use by architects, engineers, contractors, building owners, building managers and building operators." Unfortunately, I cannot see it being used by any of these groups very effectively. The real difficulty with this book is that although it is about indoor air quality, it is not a design guide book. To be a design guide book it needs to provide the reader with a clear foundation for design before going off in the various directions that the authors have taken.

The book consists of fifteen individually written chapters by ten authors. The chapters are grouped into three sections. To begin on a positive note, the final section of the book comprises 20 percent of the pages but by far the most useful information. It consists of three chapters, the first of

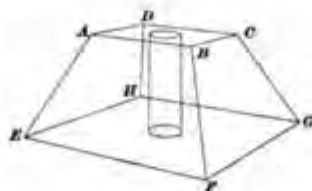
which is full of good advice on system design details and maintenance guidelines. The second is a detailed proposal/checklist for excellent commissioning of HVAC systems, while the final chapter provides a good procedure for investigating indoor air quality problems.

Less effective are the first and second sections. The first section covers sources of indoor air pollution and health effects. For a book printed in 1991, I was surprised that it did not include much information on volatile organic compounds, a significant indoor air quality issue. There was no indication that the architect and interior designer could have a substantial influence on indoor air quality by choosing materials with high or low off-gassing behavior, nor is there advice on space design.

The second section of the book covers engineering solutions to indoor air quality problems. It lacked a good introductory chapter to provide the framework into which the following chapters could be fitted. As a result, the significance of particular chapters was not obvious unless one had a strong background in the subject. For example, the chapter on using filtration to adjust the required ventilation rate only refers to particulate filtration. It should have been made obvious from the text that particulate filtration is not all that is required to improve the indoor air quality.

Even with particulate filters, there is a lot of theory about how they can be used in various positions in various systems, but the choice of filter type and filter efficiency is not covered. As a result, the information cannot be used to design or to go into the marketplace and ask for specific equipment.

The chapters in this section varied from the simple and straightforward to a level of



academic research with, as yet, little commercial building use. They included a number of chapters with surprisingly misleading titles. The chapter entitled "Evaluation of Methods for Measuring Major Indoor Air Pollutants" is limited to a discussion of the possibilities of using the surrogate CO₂ for controlling the quantity of fresh air brought into the building.

There was also no mention of P.O. Fangers' work on pollution load from the contents of buildings. Similarly, the issue

of adhesives for carpets and low VOC emissions in general was not covered. While specific facts and figures on VOC emissions may not be available, the material was also lacking facts and figures on items such as filter efficiencies, which have been known for decades.

For the engineer who is interested in the subject, the book could be considered interesting. However, the authors make numerous references to ASHRAE Standard 62-1989 without introducing the standard and explaining how the ventilation rate procedure and air quality procedure are to be used.

For those who know something about the subject, the book could be useful. As a design guide on indoor air quality, I would not recommend the book. If you would like further information on indoor air quality issues that you could browse through, then it could be worth adding to your bookshelf.

Indoor Air Quality is available from the Fairmont Press, Inc., 700 Indian Trail, Lilburn, GA 30247.

—Robert McDowall, P.Eng.
Assistant Director of Physical Plant
University of Manitoba
Winnipeg, Manitoba

Cogeneration

Cogeneration and Small Power Production Manual, by Scott A. Spiewak. Lilburn, Georgia: Fairmont Press, 1991. 664 pp. softcover.

Spiewak's manual covers regulation of production and environmental impact, engineering, contracts, financing, and preparation for power shortages. An appendix includes equipment descriptions and prices as well as names and addresses of manufacturers and state utility commissions. The work provides a thoroughly detailed overview of the information a facilities administrator wants to know about cogeneration and small power production. It is intended to provide timely and understandable materials that can serve as the basis for a cogeneration feasibility study. The book is designed for those in a position to initiate corporate investment decisions and is not intended exclusively for the expert engineer or attorney.

Although the book is a thick 664 pages and the subject is complex, the author does a good job of separating the material into clear, concise, comprehensible pieces. The work is both readable and understandable. The author lays out the alternatives for cogeneration and does a good job of clarifying complex issues, such as the history of regulatory decisions on the use of natural gas.

Several optimum examples of the cogeneration systems currently functioning in various industries are offered to the reader. If there is a weakness in the book from the viewpoint of physical plant administration, it is the lack of examples that might be applicable to the college and university environment.

"Great...one stop does it all!"

Mrs. Joanne Hale
City Promenade Apartments
Anaheim, California

**MAINTENANCE
WAREHOUSE**

Call Now
For Free
Catalog

Hardware Electrical Plumbing Appliance
1-800-431-3000

The strength of the author's opinions about the regulatory process does not interfere with the quality of technical information provided. These opinions include this position, "Regulation of rate structure (prices a utility must charge its customers in order to bring in its allowable total revenue)...has become a mechanism for discrimination against unfavored classes of ratepayers." More controversial is this declaration, "The distrust of commissions by utility management... is the major reason why we will experience power shortages in the 1990s."

Some of the key technical points the author raises include 1) the manner in which limitations on natural gas impact the kind of fuel used for cogeneration, and 2) the important question of whether a facility's cogeneration is for the purpose of selling back to the utility or for direct consumption in order to reduce Kw cost. Both have an impact on project development.

I recommend this manual for physical plant professionals who are curious about



the possibilities of cogeneration at their own facilities. The book provides the framework of information needed to determine whether cogeneration is worth pursuing.

This book is available from Fairmont Press, 700 Indian Trail, Lilburn, GA 30247.

—Eric Shawn

Superintendent, Buiding Maintenance
Reed College
Portland, Oregon

Space and Facility Planning

Planning and Managing Higher Education Facilities. New Directions for Institutional Research No. 61, ed. by Harvey H. Kaiser. Spring 1989. San Francisco: Jossey-Bass Publishers, Inc., 1989. pp 107.

The New Directions series provides a quarterly book on topics of interest to institutional research professionals. *Planning and Managing Higher Education Facilities* is the first to specifically address facilities. Each of the eight articles presents a different perspective on space planning.

Various computer software packages and algorithms are available to aid the administrator in long- and short-range space planning. The book describes the widely used tools, the limitations and inherent problems caused by changing programs, and pitfalls of generalization. It also suggests methods to reconcile macro and micro approaches to space problems.

Some institutions have sufficient space based on enrollments and total full-time-equivalent employees. The programs, however, have changed sufficiently since the space was constructed, that it is now grossly inefficient. In the present economy, construction of new space is unlikely. Possibilities for calculating costs and planning space renovation, modifying existing usage formulas to reflect actual current conditions and program needs, and life-cycle costing information in renovation requests are included.

Institutions with insufficient total space must include adjustment factors to meet minimal needs, which may be outside of existing formulas. A campus with fewer faculty offices than the number of full-time faculty, for example, will need to concentrate on generating additional functional offices, rather than creating equity of office size. An old building group may have offices that are in excess of the present size requirements for the occupants. Consideration can be given to possibly reassigning faculty requiring an office lab combination space, which could mean relocating a discipline. The excess size may be a given when considered in light of other constraints. Renovation costs to reduce office size probably exceeds the benefits.

Calculating student station use for various classroom types can be simplified and scheduled for the entire campus. Care must be taken to include individual department specifications. Lab spaces may be used for student study areas by departments requiring student use of specialized equipment for more hours than the class schedule reflects. Traditional lecture rooms may rarely be used outside of scheduled time. A campus model can be the starting point for planning. Each department should have an opportunity for input and verification prior to implementation. Building site coordinators can be used to verify usage and schedule locally controlled space.

The cost of academic space requires accountability. New space requests must be justified. Space usage for available facilities must be consistent with the academic mission of the institution. Life-cycle costing questions must be considered during the planning, construction, and use phases of facility life.

Planning and Managing Higher Education Facilities is a worthwhile addition to any administrative library. In a few short articles the problems faced by the room assignment people can be grasped. Tested methods are evaluated and explained so that they can be easily used at other institutions.

This book is available from Jossey-Bass Publishers, Inc., 350 Sansome Street, San Francisco, CA 94104.

—Kate Fenton

Fiscal Officer
University of Alaska/Fairbanks
Fairbanks, Alaska

In Brief

The National Association of Regulatory Utility Commissioners has compiled *The 1992 Directory of Energy Professionals*, which lists firms and individuals by geographic location and specialization. This book costs \$35. For more information, contact National Association of Regulatory Utility Commissioners, P.O. Box 684, Washington, DC 20044-0684; 202/898-2205.

"About Repetitive Motion Injuries," a new booklet published by Channing L. Bete Company, addresses the need to educate employees about this leading occupation illness. The booklet helps readers identify and prevent repetitive motion injuries; explains who suffers from RMI; discusses the types, causes, symptoms, and methods of prevention and treatment; and covers the relationship between ergonomics and RMI. For more information on the 16-page booklet, contact Sally W. Keir, Department PR, Channing L. Bete Company, Inc., 200 State Road, South Deerfield, MA 01373; 800/628-7733.

Energy Studies Review is an international journal on all aspects of the production and use of energy policy, energy and the environment, energy technology and science, and the social impacts of energy use. The journal, published at McMaster University, reports and comments on energy issues around the world. The subscription cost is \$44 for institutions and corporations. For more information, contact McMaster Institute for Energy Studies, McMaster University, Hamilton, Ontario, Canada L8S 4M4; 416/525-9140, ext. 4527, fax 416/521-8232.

Building Economics: Theory and Practice, a new publication by Van Nostrand Reinhold, helps architects, engineers, and facilities managers more accurately evaluate returns and risks involved in building and real estate investments. The authors, Rosalie T. Ruegg and Harold E. Marshall, cover life-cycle costing, net benefits, benefit-to-cost ratio, internal and overall rates of return, and payback. For more information, contact Van Nostrand Reinhold, Mail Order Department, P.O. Box 668, Florence, KY 41022-0668; 800/926-2665.

Job Corner

Job Corner Deadlines

Job Corner advertisements are available to any nonprofit institution with a facilities-related position opening available. Positions wanted ads are also welcome. Regular classified advertisements cost \$20 per column inch; display ads cost \$25 per column inch. There is a two-inch minimum charge on all ads, and no agency discounts are available. If you would like to include a camera-ready logo with your display ad, please mail it to APPA by the ad deadline. APPA does not accept faxed logos.

Upcoming Job Corner deadlines are **August 10** for the September issue, **September 10** for October, and **October 9** for November. Closing deadlines for job announcements are posted at the request of each institution. In some cases, deadlines may be extended by an institution. APPA encourages all individuals interested in a position to inquire at the institution regarding its closing/filing date.

Send all ads, typed and double-spaced, with an official purchase order to Diana Tringali, Job Corner Advertising, APPA, 1446 Duke Street, Alexandria, VA 22314-3492. Or send your ad via fax 703/549-APPA (703/549-2772). Call 703/684-1446 for more information.



Director, Physical Facilities, the University of Missouri/Rolla. The University of Missouri/Rolla is seeking a director of physical facilities who will report to the vice chancellor, administrative services. The university has 1,100 faculty and staff and an enrollment of 5,100 students, with 1.8 million square feet of floor space in 73 buildings, and a total of 220 acres of main campus property. The director's basic function and responsibility is to direct the planning, management, and operations of UMR's physical facilities department, including administration of physical facilities'

THE UNIVERSITY OF TEXAS/AUSTIN PHYSICAL PLANT MANAGER OF ARCHITECTURAL AND ENGINEERING SERVICES

The University of Texas/Austin is a preeminent educational institution with a current enrollment of 47,500 students. The physical plant department has a staff of 1,141 employees and is responsible for more than 12,500,000 square feet located on the main campus and at several satellite locations.

This position requires a bachelor's degree in architecture or engineering plus ten years of experience in facilities design, construction, and maintenance, with two years of experience supervising such work. Must be licensed as a professional engineer or architect and be willing and able to obtain State of Texas registration. Prefer directly related experience gained at an institution of higher education and demonstrated knowledge of CAD systems.

Manager plans, schedules, and assigns work to professional and technical staff; evaluates work performance; conducts final reviews of design projects; interviews and hires new personnel; prepares and monitors section budget; prepares special studies and reports. Manages a section of forty employees consisting of architects, engineers, drafting technicians, construction inspectors, contract administrators, and administrative staff. The section is currently handling an annual volume of \$12 million in alterations, renovations, and maintenance projects and is equipped with a CAD system.

The manager reports directly to the director of physical plant.

Starting salary is \$40,836 or more, annually. Excellent fringe benefits. Submit resume and letter of interest by **July 31, 1992** to:

Phillip Walter
Employment Center
Office of Personnel Services and Employee Relations
University of Texas/Austin
P.O. Drawer V
Austin, TX 78713-7449

An equal opportunity/affirmative action employer. In compliance with Americans with Disabilities Act.

funds and state capital funds. Major departmental functions include maintenance of building/grounds, engineering/construction services, and facilities operations. The candidate must have a bachelor's degree in an engineering area or an equivalent combination of education and experience from which comparable knowledge and abilities can be acquired. To qualify, the candidate must have six years of progressively responsible physical plant experience (to include administration and supervision), preferably in higher education; demonstrated effectiveness in human resource management and public relations in a multi-cultural environment; administrative and financial management experience; and effective interpersonal and public experience. Submit application letter, resume, and three references by **July 24, 1992** to: University of Missouri/Rolla, Human Resources Services, 109 Altman Hall, Rolla, MO 65401. *The University of Missouri/Rolla is an equal opportunity/affirmative action employer. Woman and minorities are encouraged to apply.*

Facilities Planning Director I #9506.

Grade: Pending state approval. Manages all facilities planning efforts for the university to include master plan studies, requirements identification, and programming for all new facilities; develops budget stage feasibility, programming, and siting studies for major building projects; prepares precinct studies of selected campus sub-areas to develop details of specific site use, height and bulk of buildings and pedestrian and vehicle ways. Require graduation from a four-year college or university with a degree in architecture planning or engineering. Five years of experience in architecture facility planning or engineering work including three years of experience in large-scale institutional or agency planning; or an equivalent combination of training and experience. Closing date: **July 10, 1992** or until position is filled. To obtain an application, call 704/547-2275. Send applications to Personnel Services Office, University of North Carolina/Charlotte, Highway 49 North, Charlotte, NC 28223. AA/EEOE.

ASSISTANT VICE PRESIDENT FACILITIES PLANNING & MANAGEMENT

Wayne State University is an urban research institution with more than 100 buildings situated on approximately 185 acres in Detroit, Michigan. WSU is seeking an experienced facility manager for the position of assistant vice president for facilities planning and management.

The assistant vice president directs planning efforts including budgeting, capital project requests, architect selection, design supervision, campus planning and interior design, plus physical plant operations including construction, rehabilitation, maintenance, custodial and grounds. Wayne State University is a leader in recognizing and funding deferred maintenance needs.

The facilities work force consists of 350 employees represented by eight unions. The assistant vice president reports directly to the senior vice president for administration and finance.

A bachelor's degree in architecture or engineering, five to seven years of applicable managerial experience in the public sector, and professional registration are required. An advanced degree in engineering or architecture, university experience, and demonstrated success in a unionized environment are desirable.

Salary and benefits are attractive. Position available July 15, 1992. Please send resume and salary history to the address listed below:

Wayne State University
Employment Services
100 Antoinette, Room 263
Detroit, MI 48202
Posting #774

Wayne State University
is an affirmative action/
equal opportunity employer.

FACILITIES ENGINEERING

Southwest Research Institute's Office of Facilities Engineering has an immediate opening for an Electrical Facilities Engineer to design electrical transmission and building systems for new and remodeled facilities. Candidate will assist with professional functions such as: develop and maintain standards for design and construction; administer and monitor electrical construction; and coordinate work of design professionals retained by the institute. Requires a bachelor's degree in electrical engineering and a minimum of ten years experience as a principal or project manager with administrative responsibilities. Applicants with experience in electrical transmission and consulting engineering will receive preferred consideration, as will those with familiarity with high-tech facilities. The position requires State of Texas professional registration as an electrical engineer and familiarity with building codes.

Southwest Research Institute is an applied, development organization with competitive salaries and a comprehensive benefit program, including health, dental, life, and disability insurance reimbursement, paid vacations and holidays, and a pension plan.

Please send resume to: Mr. B.W. Youngs, Employment Manager, Southwest Research Institute, Personnel Department #647, P.O. Drawer 28510, San Antonio, TX 78228-0510.



**SOUTHWEST
RESEARCH
INSTITUTE**

An Equal Opportunity/Affirmative Action Employer

Facilities Manager

**For information about
advertising in
Job Corner call:**

703-684-1446

MANAGER OF DESIGN SERVICES UNIVERSITY OF MISSOURI/ COLUMBIA

The University of Missouri/Columbia has an immediate opening for manager of design services. UMC, located in central Missouri, has an enrollment of 24,000 and is the flagship campus of the University of Missouri System. The design services department provides architectural and engineering services for the construction, renovation, and repair of campus facilities.

Reporting to the director of planning, design, and construction, the manager of design services will lead a staff of fifteen FTE. This is a position of high visibility and impact and requires a results-oriented leader and an effective communicator.

Qualifications include a bachelor's degree in architecture or mechanical engineering, at least seven years of experience, and professional registration in Missouri. Previous institutional experience is a plus. Salary commensurate with qualifications.

To apply, submit a letter of interest, resume, and salary history by **July 17, 1992** to:

Mr. Donald J. Guckert
Director of Planning, Design &
Construction
University of Missouri/Columbia
General Services Building,
Annex B
Columbia, MO 65211

The University of Missouri is an affirmative action/equal opportunity employer.

Has your institution or department received special recognition, or have you undertaken new or innovative projects? If so, please send them to us for possible inclusion in the newsletter or magazine. Send all items to Stephanie Gretchen, APPA, 1446 Duke Street, Alexandria, VA 22314-3492; 703/684-1446, fax 703/549-2772.

Coming Events

APPA Events

Contact the APPA Educational Programs Department at 703/684-1446.

Jul. 26-29—Winning the Race with Change: APPA's 79th Annual Meeting. Indianapolis, IN.

Aug. 23-28—Institute for Facilities Management. Boston, MA.

Other Events

Aug. 16-19—National Conference of States on Building Codes and Standards Annual Conference. San Diego, CA. Contact: NCSBCS, 505 Huntmar Park Drive, Herndon, VA 22070; 703/437-0100.

Aug. 19-20—IEEC '92: International Energy & Environmental Congress. Chicago (O'Hare), IL. Contact: Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, GA 30340; 404/925-9558.

Sep. 9-10—1992 North American Conference on Industrial Recycling and Waste Exchange.

ENVIROWASTE MANAGEMENT

New Career...Bright Future

Be a Certified Specialist Consultant
Your business...job...profession

- Waste management
- Compliance/regulations
- Environmental laws
- Hazard management
- Reporting regulations

Home Study Program Includes:

- Physics and chemistry
- Human physiology
- Ecology
- Envirowaste sciences
- Laws and regulations

For a free booklet, call or write:

1-800-527-9537 • Fax 1-800-842-7574
1509 Baltimore • Kansas City, Mo. 64108

ENVIROWASTE MANAGEMENT INSTITUTE OF AMERICA

Division of
National Institutes of America
Since 1981



Name _____
Address _____
City _____
State/Zip _____
Telephone _____

Syracuse, NY. Contact: Government Institutes, Inc., 4 Research Place, Suite 200, Rockville, MD 20850; 301/921-2300.

Sep. 14-16—Facilities Planning: Plant Expansion and Rearrangement. Washington, DC. Contact: George Washington University, School of Engineering and Applied Science, Washington, DC 20052; 202/994-6106, 800/424-9773.

Sep. 16-17—Texas Plant Engineering & Maintenance Show. Houston, TX. Contact: Professional Trade Shows, Inc., 416 South Hillview Drive, Milpitas, CA 95035; 408/946-5600.

Sep. 17-18—Computer Aided Industrial Facilities Design. Washington, DC. Contact: George Washington University, School of Engineering and Applied Science, Washington, DC 20052; 202/994-6106, 800/424-9773.

Sep. 21-24—46th Northwest Turfgrass Conference. Sun River, OR. Contact: Northwest Turfgrass Association, P.O. Box 1367, Olympia, WA 98507; 206/754-0825.

Sep. 21-25—Introduction to Industrial Ergonomics: Principles & Practice. Park City, UT. Contact: Rocky Mountain Center for Occupational and Environmental Health, Building 512, University of Utah, Salt Lake City, UT 84112; 801/581-5710.

Sep. 24-25—Fundamentals of Energy Management. Washington, DC. Contact: Registrar, Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, GA 30340; 404/447-5083.

Sep. 28-Oct. 2—Advanced Industrial Laser Welding. Washington, DC. Contact: George Washington University, School of Engineering and Applied Science, Washington, DC 20052; 202/994-6106, 800/424-9773.

Sep. 29-30—Midwest Plant Engineering & Maintenance Show. Minneapolis, MN. Contact: Professional Trade Shows, 416 South Hillview Drive, Milpitas, CA 95035; 408/946-5600.

Oct. 6-8—Northern California Plant Engineering & Maintenance Show. Santa Clara, CA. Contact: Professional Trade Shows, 416 South Hillview Drive, Milpitas, CA 95035; 408/946-5600.

Oct. 6-9—Thermographic Applications for Predictive Maintenance. Charlotte, NC. Contact: John Snell & Associates, 17 First Avenue, Montpelier, VT 05602; 802/229-9820.

Oct. 13-15—7th Annual IDHCA Cooling Conference. Princeton, NJ. Contact: IDHCA, 1101 Connecticut Avenue, N.W., Suite 700, Washington, DC 20036; 202/429-5111.

Oct. 14-16—Buildings and Grounds Annual Workshop. Fredericksburg, VA. Contact: Dianne Davis, Superintendent, Buildings and Grounds, 1700 Memorial Avenue, Lynchburg, VA 24501; 804/847-1626.

Oct. 18-21—IAQ '92: Environments for People. San Francisco, CA. Contact: Jim Norman, ASHRAE, 404/636-8400.

Oct. 24-27—1992 SAIR/SCUP Conference: Catching the Waves of the '90s. Myrtle Beach, SC. Contact: Julie K. Snyder, SAIR/SCUP Conference Planning Committee, Institutional Research, 129 Smyth Hall, Virginia Tech, Blacksburg, VA 24061-0433; 703/231-7922.

Oct. 26-30—Asbestos Analysis by Polarized Light Microscopy. Salt Lake City, UT. Contact: Rocky Mountain Center for Occupational and Environmental Health, Building 512, University of Utah, Salt Lake City, UT 84112; 801/581-5710.

Nov. 8-11—National Institute on Park and Grounds Management Annual Conference. Richmond, VA. Contact: National Institute, P.O. Box 1936, Appleton, WI 54913; 414/733-2301.

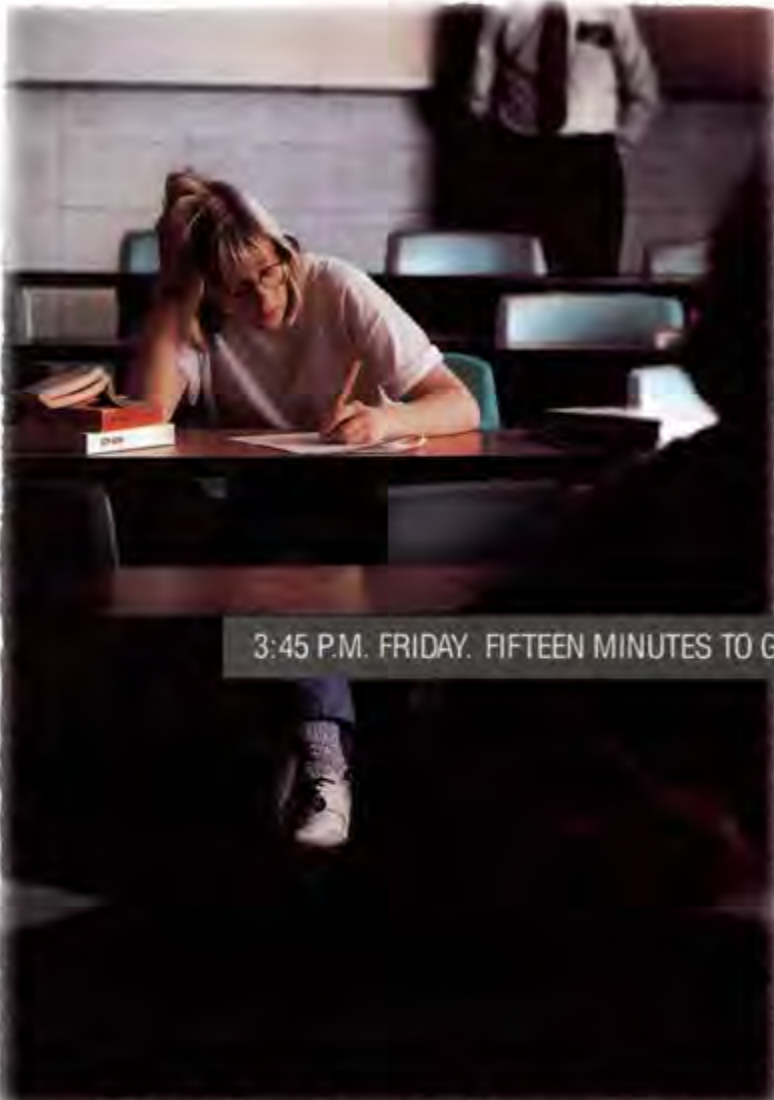
Nov. 11-12—Southern California Plant Engineering & Maintenance Show. San Diego, CA. Contact: Professional Trade Shows, 416 South Hillview Drive, Milpitas, CA 95035; 408/946-5600.

Nov. 15-19—Green Industry Expo/PGMS 81st Annual Conference. Indianapolis, IN. Contact: PGMS, 10402 Ridgland Road, Suite 4, Hunt Valley, MD 21030; 410/667-1833.

Nov. 16-17—Facilities Management for Senior Executives. Dedham, MA. Contact: Massachusetts Institute of Technology, Office of Facilities Management Systems, Room E19-451, 77 Massachusetts Avenue, Cambridge, MA 02139; 617/253-6148.

Index of Advertisers

American Building Maintenance	44
APPA Annual Meeting Exhibitors	12
Black and Veatch	52
Data Systems Services	11
Dugmore & Duncan	33
Envirowaste Management	50
FulCircle Ballast Recyclers	9
HOST/Racine	21
ISES Corporation	2
Johnson Controls	51
Maintenance Warehouse	46
Management Systems	20
MCC Construction	cover 2
Motion Control Engineering	cover 3
Musco Sports Lighting	6
SFT, Inc.	11
Southern Bleacher Company	11
Standard Enterprises	7
Virginia Tech	9
Vulcan Signs	cover 4

A large photograph of a student with blonde hair, wearing a white t-shirt, sitting at a desk in a classroom. She is leaning over a notebook, writing with a pencil. Her head is resting on her hand, suggesting concentration or fatigue. In the background, other students are seated at desks, and a teacher is standing near the front of the room. The lighting is soft, and the overall atmosphere is one of a quiet, focused learning environment.

An improved learning environment made this student a success. Johnson Controls helped make it possible.

The true mark of a quality college or university is in the education opportunities it can offer students.

In fact, in these days of scarce funds,

3:45 P.M. FRIDAY. FIFTEEN MINUTES TO GO. ENGLISH FINAL. HONOR ROLL PENDING.

many schools find it hard to offer innovative instruction, let alone provide basic educational necessities. Like comfortable, well-lit classrooms, safe hallways, and effective professors.

Johnson Controls can help. We'll create an interactive energy management program that turns money you spend on utilities into money you can invest in educating students more effectively. And we'll help you save more through upgraded mechanical and electrical systems. So you get more efficient buildings, as well as more comfortable, productive learning environments.

Best of all, you don't need to raise taxes or tuition. You finance the investment from the energy savings that our products and services produce. Put new solutions in *building comfort, security and productivity*, to the test. Call your local

Johnson Controls office, or 1-800-972-8040, soon.

And expand your honor roll instead of your utility budget. See us at the APPA show, booth 401.



Is Your Facilities Management Information Driving You Crazy?

If So, Let Black & Veatch Steer You In The Right Direction

Utilizing the Technology of Automated Mapping and Facilities Management (AM/FM), Black & Veatch Has Developed Tools that Enable You to Capture, Store, Display, Manipulate, and Easily Update Facilities Management Information. These Tools Can be Used for:

- Facilities Management & Space Utilization
- Operations & Maintenance Management
- Work Order Processing & History
- Building Systems Management
- Utilities Management
- Communications Management
- Mapping
- Master Planning
- Engineering Studies
- Concept Modeling

For Further Information or to Receive a Copy of Our Facilities Management Video, Please Call Gerald Snyder at (913) 339-8223

Plan to Visit Our Booth, and Attend Our Technical Session, to Learn More About Your Opportunities in Computerized Facilities Management



Elevator Maintenance & Management Made Easy!

Many universities and colleges have successfully made the maintenance and management of their elevator systems easy through use of MCE's NON-PROPRIETARY CONTROLLERS.

"CMS" CENTRAL MONITORING SYSTEM

MCE's "CMS" CENTRAL MONITORING SYSTEM allows you to monitor all your elevators from a central location that is convenient for you. You can monitor selected events and receive emergency reports.

In case of elevator shut downs or other designated emergencies the "ECI" (Elevator Communication Interface) will automatically initiate a call to the CENTRAL COMMAND CENTER.

"CMS" is user friendly and can be installed on your IBM PC compatible computer system.

MCE's CENTRAL MONITORING SYSTEM further enhances your ability to maintain and manage elevator systems while helping reduce cost.

When you specify MCE products, any elevator contractor can install and maintain your elevators at minimum cost.

For information please call us.



MCE
MOTION CONTROL ENGINEERING, INC

Specializing in State-of-the-Art
Elevator Products & Control Systems.

11354 White Rock Road
Rancho Cordova, CA 95742
(916) 638-4011 Fax:(916) 638-0324

Signs Signs Signs Signs Signs Signs



Vulcan Signs a leader in the Governmental and Commercial Sign Market for over 55 years can offer you, The Facilities Manager, a complete line of Traffic Signs and related products.

Call us toll free Today !!



Vulcan Signs

800-633-6845

in Alabama 800-426-1314

P.O. Box 850

Foley, Alabama 36536-0850

"An Employee Owned Company"

The official
publication of AFA,
The Association of
Higher Education
Facilities Officers

Facilities Manager

1446 Duke Street
Alexandria, Virginia 22314-3492

Nonprofit
U.S. Post Paid
Alexandria, VA
Permit No. 653