

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

Facilities Manager

Volume 9 Number 4

Fall 1993



Diane Kerby

The *Southern Style*
of APPA's new president

"Who's in Charge Here?"

▼

You know what you want, but do you always get it? Are you really in control of your maintenance, repair and minor construction projects, or do contractors and suppliers control your schedule, cost and quality? With Delivery Order Construction, you control a Unit Price database listing real costs for over 30,000 work items. You control our on-site design/build team dedicated to delivering your projects at your prices, on your schedule. No minimum, no maximum, no surprises. You even control our profit margin. And we guarantee quality, it's our job security. DOC can cut your project costs and acquisition lead time in half, while putting you firmly in control of the entire process. Call us, and we'll send you a free videotape that explains how....after all, knowledge is power.

▼

You're already in charge....take control.

▼

1 800 962 1604

M C C

C O N S T R U C T I O N
C O R P O R A T I O N



The Southern Style of APPA's New President: Diane Kerby

by Pauline O. Hovey

14

Cover photo by Tim Riley
Berea College Public Relations

FEATURES

18 Strengthening the Role of Facilities Management in a Small Institution

by Keith H. Lovin

22 Learning from Success and Failure in Quality Management

by J. T. Petillo

26 Facilities Networking Through the Internet

by Jayne Levin

30 Planning for Master Planning: Setting Realistic Expectations

by John R. Reeve,
AIA and Marion B. Smith, AIA



40 Miami University Recycles!

by Stephen K. Gaski

DEPARTMENTS

From the Editor.....3

APPA News.....4

- Rutgers Energy and Environment Plan
- HEFT Donation to Assist HBCUs
- APPA Committees 1993-1994

Capital Notes.....6
by Barbara Hirsch

Focus on Management.....9
by Sigmund G. Ginsburg

Perspective.....10
by Alan L. Ingle, Ed.D.

Global Exchange.....44
by Arthur W. Bradley

Data Base Update.....46
by Howard Millman

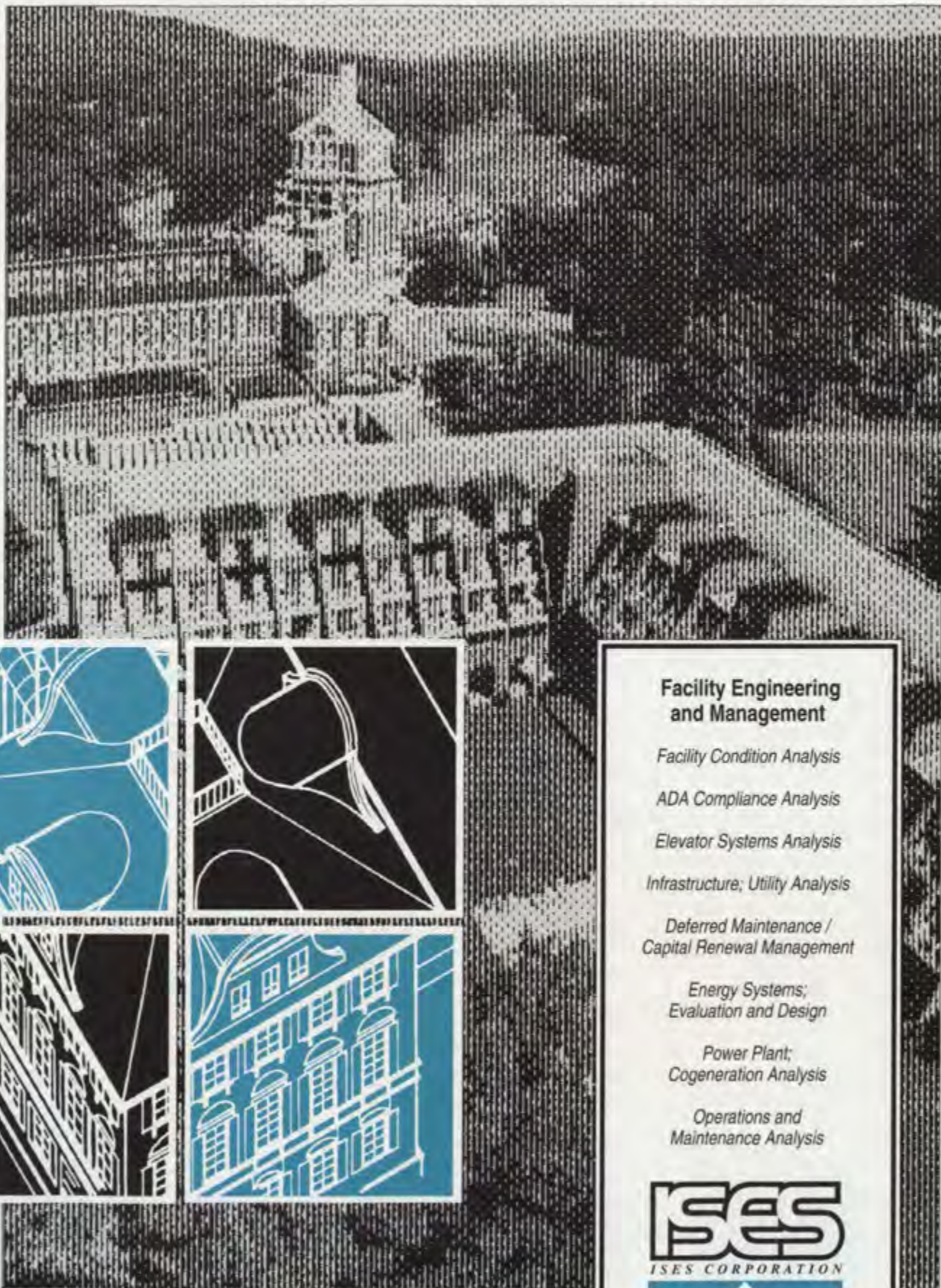
The Bookshelf.....48
reviewed in this issue:
■ The Campus Green

Job Corner.....49

Coming Events.....50

Index of Advertisers.....50

engineered solutions



Facility Engineering and Management

Facility Condition Analysis

ADA Compliance Analysis

Elevator Systems Analysis

Infrastructure; Utility Analysis

*Deferred Maintenance /
Capital Renewal Management*

*Energy Systems;
Evaluation and Design*

*Power Plant;
Cogeneration Analysis*

*Operations and
Maintenance Analysis*

ISES
ISES CORPORATION

**Intelligent Systems &
Engineering Services**

2165 West Park Court / Suite N / Stone Mountain, Georgia 30087
Telephone: (404) 879-7376 / Facsimile: (404) 879-7825

Facilities Manager

PRESIDENT: E. Diane Kerby
Berea College

EXECUTIVE VICE PRESIDENT: Walter A. Schaw
Alexandria, Virginia

PUBLICATIONS ADVISORY BOARD:

Ex-officio

Steve Glazner, APPA Director of
Communications, Chair

John P. Harrod Jr., Vice President for
Educational Programs, University of
Wisconsin/Madison

George T. Preston, Vice President for
Information Services, Art Institute of
Chicago

Thomas F. Vacha, Vice President for
Professional Affairs, University of
Delaware

Term ending July 1994

Charles W. Jenkins, Saint Mary's
University

William D. Middleton, University of
Virginia (retired)

Term ending July 1995

Mohammad H. Qayoumi, San Jose State
University

Roger E. Rowe, Miami University

Term ending July 1996

Brenda N. Albright, Tennessee Higher
Education Commission

James J. Murray III, American Council
on Education

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

E-MAIL: APPAINFO@CNLORG

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 © 1993 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.

From The Editor

Steve Glazner

Diversity and ethics are the two watchwords from new APPA President Diane Kerby, and they couldn't have come at a better time. At the same time that society is beginning to recognize the value—indeed, the existence—of a workplace comprising the talents and unique qualities of employees of many backgrounds, we still see racial and ethnic tension, ignorance and fear of change, and prejudice based on gender, age, race, belief, sexual orientation, or physical ability. We may even harbor some of these resentments and prejudices ourselves.

Our receptiveness to diversity in the workplace, and in society at large, informs our ethical choices as well. If we are not equitable in our dealings with staff because of gender or cultural differences, we may be making unwise or inappropriate personal and professional decisions as well.

See the profile of Diane Kerby in this issue for an introduction to APPA's first woman president in its eighty-year history. Kerby comes from Berea College in Kentucky and is the first APPA president in twenty years from a small college. Small colleges which make up nearly 70 percent of our member institutions.

Another person from a small

college, Dr. Keith Lovin of Maryville University, presented an inspiring and valuable message at APPA's annual meeting in St. Louis, and his comments are reprinted here.

You'll also find in this issue the annual meeting presentation of Tom Petillo on TQM at Florida Power and Light, guidelines on how to plan for master planning, and a report on the recycling program at Miami University. In addition, we've included an article on how some facilities officers are improving their efficiency and communication by using the Internet and other electronic information sources.

This issue marks the consolidation of two popular departments. The Environment, written by Stephanie Gretchen since its inception several years ago, will now be included in Barbara Hirsch's Capital Notes. I thank both Stephanie and Barbara for their excellent work on these columns.

Be watching for the Winter 1994 issue of *Facilities Manager*, due out in January. The theme will be on energy and utilities management, and the feature articles will focus on new technologies, lighting innovations, the implications of the Energy Policy Act of 1992, cogeneration, and much more. ■

APPA News

Rutgers Plan Conserves Energy and Environment

The Newark campus of Rutgers, The State University of New Jersey, began an initiative that will provide economic gains as well as environmental benefits for the community. This summer the university began to install energy-efficient lighting in fifteen campus buildings. Donald T. Little, director of physical plant and plant account management said that Rutgers/Newark will save 4.4 million kilowatt hours per year while benefiting from improved lighting quality, reduced maintenance



costs, and lower air-conditioning loads. Energy savings will exceed \$400,000 per year, said Little.

Rutgers will salvage and recycle the 50,000 lamps, 20,000 ballasts, and steel, plastic, and cardboard from the project.

The campus received a \$200,000 grant from the U.S. Department of Energy for the project. Little said the annual savings will be placed in a special account to produce a "cash pump" for further energy conservation measures for the Rutgers/Newark campus.

The Honorable Hazel Rollins O'Leary, U.S. Secretary of Energy, accepts a certificate of appreciation from APPA: The Association of Higher Education Facilities Officers, presented by Donald T. Little, director of physical plant asset management at Rutgers University's Newark campus. The APPA award was presented in recognition of a 15-year partnership between DOE and the nation's colleges and universities that strive to improve energy efficiency and conserve the environment.

HEFT Donation to Assist HBCUs With Scholarships

Subscribing member Ogden Allied Services Corporation donated \$7,500 to APPA's Higher Education Facilities Trust (HEFT) to be used to assist facilities managers at historically black colleges and universities. There are approximately 120 historically black institutions which enroll 300,000 students and graduate 40,000 annually. These institutions have traditionally had a long history of facilities underfunding and limited operating revenues. Through Ogden's contribution, APPA will offer six scholarships for the 1994 Institute for Facilities Management. The Institute is held every January and August. The scholarships will cover tuition and room costs. For more information, contact the APPA Educational Programs Department at 703-684-1446.

ANADAC Facilities Group

Facilities Engineering

Building Evaluation Reports
Facility Condition Reports
Quality Assurance Plans
Condition Assessments
Building Audits

Program Management

Operations and Maintenance
Planning and Programming
Installation and Start Up
Dispute Resolution
Project Oversight

Maintenance Management

Preventive Maintenance Programs
Service Contract Preparation
Work Management Systems
Productivity Assessment
Organizational Analysis



ANADAC

2011 Crystal Drive Suite 401; Arlington, VA 22202 (703) 271-6820
109 Governor Street Suite 507; Richmond, VA 23219 (804) 786-7366
2129 General Booth Blvd. Suite 103; Virginia Beach, VA 23454 (804) 721-3094

Corrections

In Roger Rowe's article on TQM training and implementation (in the Summer 1993 *Facilities Manager*), APPA failed to include the author's footnotes that credit the Reliability Analysis Center, the Federal Quality Institute, Ford Motor Company's Ford Q-101 Quality System Standard, and Forest Gale's "An Executive Quality Management Action Model."

Due to a proofreading error, the training topics listed on page 51 were inadvertently credited to APPA. The heading should read, "MAPPA Trainers Network Physical Plant Training Topics." *Facilities Manager* regrets these errors.

APPA Committees 1993-1994

Educational Programs

- John P. Harrod Jr., V.P.* • Univ of Wisconsin/Madison • Chair
608-263-3077
Patty Galmiche • Rutgers University • ERAPPA • 908-932-5045
James O. Roberts • Georgetown College • SRAPPA • 502-863-8639
Gary L. Reynolds • Iowa State University • MAPPA
515-294-9633
Emily C. Wren • Indiana University/Purdue Univ • MAPPA
317-274-4553
George F. Krell • University of Wyoming • RMAPPA
307-766-2266
Martin E. Holzman • Cal State Univ/Northridge • PCAPPA
818-885-2325

Information Services

- George T. Preston, V.P.* • Art Institute of Chicago • Chair
312-443-3940
David R. Collette • Mount Holyoke College • ERAPPA
413-538-2012
C. Gary Pringle • Converse College • SRAPPA • 803-596-9744
Michael Gardner • Butler University • MAPPA • 317-283-9393
John D. Rulfs • Stephen F. Austin State Univ • CAPP
409-568-4341
Dean Wolf • Auraria Higher Ed Center • RMAPPA
303-556-3292
Jeanne O'Dell • Cal State Univ/Long Beach • PCAPPA
310-985-8886

Professional Affairs

- Thomas F. Vacha, V.P.* • University of Delaware • Chair
302-831-2616
Richard M. Engle • Rutgers University • ERAPPA
908-932-2600
William L. Columbus • University of Alabama • SRAPPA
205-348-4534
J. Kirk Campbell • Carleton College • MAPPA • 507-663-4460
Tom Jones • Univ. of Texas/Southwestern Medical Center • CAPP
214-648-3700
Douglas K. Christensen • Brigham Young University • RMAPPA
801-378-5700
Thomas E. Harkenrider • The Salk Institute • PCAPPA
619-453-4100 x432

Awards and Recognition

- William S. Mutch* • University of Calgary • Chair • 403-220-7555
James McChesney • SUNY College/Cortland • ERAPPA
607-753-2100
Robert W. Collins • Davidson College • SRAPPA • 704-892-2220
William W. Whitman • Iowa State University • MAPPA
515-294-8079
Glenn Grippe • Univ of Arkansas/Fayetteville • CAPP
501-575-6593
Randy Turpin • University of Utah • RMAPPA • 801-581-6510
John R. Amend • University of Nevada/Las Vegas • PCAPPA
702-739-3281

Facilities Administration NACUBO

- Paul F. Taboli* • University of Colorado • RMAPPA
303-492-7120
Pieter van der Have • University of Utah • RMAPPA
801-581-5082

Government Relations Task Force

- C. Ronald Hicks* • Univ of California System • Chair
510-987-9390
Donald Little • Rutgers University/Newark • ERAPPA
201-648-5713
Elsa Pena • Agnes Scott College • SRAPPA • 404-371-6331
Gary R. Kent • Indiana University/Bloomington • MAPPA
812-855-6169
Arthur B. Jones • Black Hills State University • CAPP
605-642-6245
Pieter van der Have • University of Utah • RMAPPA
801-581-5082
Chris Christofferson • Cal State Poly Univ/Pomona • PCAPPA
909-869-4397

International

- Roy Dalebozik* • McGill University • Chair • 514-398-4569
Edwin A. Deas • James Cook Univ of North Queensland
(Australia) • Australia and Far East • 077-814481
Rex O. Dillow • Member Emeritus • Middle East • 314-445-7183
F. Louis Fackler • Member Emeritus • South America
408-426-6254
C. Ronald Hicks • Univ of California System • West Coast Tours
510-987-9390
Wolfgang Schlottman • University of Dortmund (Germany) • Europe
231-755-3303
Winthrop R. Wassenar • Williams College • East Coast
Tours/England • 413-597-2301

Membership

- Michael D. Faires* • Clemson University • Chair • 803-656-4935
Michael J. Sofield • Smithsonian Institution • ERAPPA
202-357-1665
C. Brent Douglass • Randolph-Macon College • SRAPPA
307-268-2492
Joseph P. Kish • Northeastern Illinois Univ • MAPPA
312-794-2878
Richard Hoback • University of Nebraska/Lincoln • CAPP
402-472-8086
Stanley P. Hobbs • University of Wyoming • RMAPPA
307-766-2266

- Farouk Wang* • University of Hawaii • PCAPPA • 808-956-8686

Rightsizing Task Force

- Frederick L. Klee* • Ursinus College • Chair • 215-489-4111
Dean H. Fredericks • SUNY Buffalo • ERAPPA • 716-645-2236
Ronald T. Flinn • Michigan State University • MAPPA
517-355-3366
Pieter van der Have • University of Utah • RMAPPA
801-581-5082
Scott Charmack • Cal State Univ/Long Beach • PCAPPA
310-985-4131

- Ed Naretto* • Cal Poly State Univ • PCAPPA • 805-756-2321

Small College Committee

- E. Dudley Howe* • Stetson University • Chair • 904-822-8800
John P. Holmes • Messiah College • ERAPPA • 717-691-6011
Robert L. Lewis • Augustana College • MAPPA • 309-794-7278
Mike Releford • University of the South • SRAPPA
615-598-1264
Neal R. Swarnes • Cottey College • CAPP • 417-667-2691
Jeff L. Turner • Casper Community College • RMAPPA
307-268-2492
Larry Klunas • Occidental College • PCAPPA • 213-259-2654

Capital Notes

Barbara Hirsch

Energy and Environment

Indoor air bill marked up by Senate—The Senate Environment Committee marked up a bill July 30 that would regulate indoor air pollution. S 656, sponsored by House Majority Leader George Mitchell (D-ME), would provide additional money for indoor air quality research, air quality testing, and methods to reduce indoor air pollution exposure. The bill would require that the EPA:

- Develop national and federal building response plans to improve indoor air quality and establish a demonstration program;

- Establish programs to publicize practices to curb indoor air pollution, and authorize federal grants for state projects to perform indoor air quality assessments and develop state response programs;

- Issue a list of indoor air contaminants within 240 days of enactment of the legislation and develop health advisories for each contaminant;

Radon safety bill markup—On July 30, the Senate Environment Committee marked up a companion bill (S 657) to its indoor air package that would require radon testing in federally

owned housing. In addition, new federal buildings would have to meet EPA radon construction standards. The bill would also provide the following protections:

- Federally-assisted housing in high-risk radon areas would have to meet EPA construction standards, and federally assisted mortgages for new homes in high-risk areas would be prohibited unless they meet with EPA standards;

- Realtors would be required to provide potential buyers standard radon information, and radon detection equipment and services would have to be evaluated by the EPA;

- Home buyers would be guaranteed a contract contingency allowing them to cancel within ten days if an inspection reveals excessive radon levels in the home.

In addition, EPA would be required to conduct a national radon education campaign and a survey of radon in the workplace.

A similar bill (HR 2448), introduced by Rep. Edward J. Markey (D-MA), was considered in a joint hearing of the Energy and Commerce Subcommittee on Transportation and Hazardous Materials and the Subcommittee on Health and the Environment on July 14. However, action on this bill was postponed until after the August recess due to opposition from industry and certain Energy and Commerce Committee members.

House hearings on risk assessment—The House Science, Space, and Technology

Subcommittee on Science held hearings on risk assessment on July 26. Among those testifying was Sen. Daniel Patrick Moynihan (D-NY), who introduced a risk assessment bill (S 110) before the Senate on January 21. Provisions in the Senate bill would

- Establish two independent advisory panels at EPA, one to assist in ranking environmental risks, the other to weigh the relative benefits of risk abatement;

- Establish guidelines for risk assessment, create an environmental risk research program at EPA, and an inter-agency panel on risk.

Critics of risk assessment cite that problems with testing methods, such as use of animals, and lack of data for some hazards, make for unreliable information and subjective political solutions. Environmentalists charge that risk assessment is used as an excuse by industry to continue to pollute, and say that Congress should allocate more money to environmental protection rather than trying to decide where to best allocate inadequate resources. Other criticisms include that risk assessment overlooks the underprivileged and minorities who are more likely to live near factories, hazardous waste sites, and other sources of pollution.

Proposed rule on underground storage tanks—The EPA has proposed a rule to allow some UST owners, including local governments, an extension of their financial responsibility compliance date to December 31, 1998. The compliance date extension would provide relief to certain UST owners in order to ensure that adequate supplies of petroleum are available to rural communities and for the provision of essential community services. Criteria proposed to determine eligibility for the 1998 compliance date include compliance with technical requirements, operation of tanks in rural areas, a hardship criterion for

Barbara Hirsch is APPA's director of government relations.



petroleum marketers, and an essential services criterion for local governments. The EPA has excluded nonmarketers from the proposed rule, but will accept comments regarding the exclusion.

Comments are due by October 31, 1993 and should be mailed to the Docket Clerk (Docket No. UST-3-15), Office of Underground Storage Tanks (OS-400), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460. For further information, contact the RCRA/Superfund Hotline at 800-424-9346 or 703-412-9810. For technical questions, contact Andrea Osborne in the Office of Underground Storage Tanks at 703-308-8883.

EPA air quality information available on-line—The EPA's Office of Air Quality Planning and Standards offers on-line air quality information on the OAQPS Technology Transfer Network (TTN). The TTN provides a wide range of air pollution information, including guidance and rulings on the Clean Air Act Amendments. The TTN is accessible to Internet users through Telnet. Following the Telnet command type the following address: ttnbbs.rtpnc.epa.gov. The TTN is also available to non-Internet users at 919-541-5742. The help hotline number is 919-541-5384.

Grants

Senate committee approves federal grant and loan program for voluntary cleanup of toxic waste sites—The Voluntary Environmental Cleanup and Economic Redevelopment Act of 1993 (S 773) was approved July 30 by the Senate Committee on Environment and Public Works. The bill would establish a program of federal grants and loans for voluntary cleanup of approximately 20,000 toxic waste sites with low levels of contamination. These sites, which pose a relatively small hazard to public health and safety, are not covered under the Superfund cleanup program. The bill would

Establish seed grants of \$200,000 to \$500,000 for states to establish voluntary cleanup programs;

Provide federal grants of up to \$100,000 to local governments for the purpose of identifying and assessing

sites that would be eligible for further assistance under the program;

Establish a revolving loan fund to provide low-interest loans to potential purchasers and owners of contaminated properties. Under this provision,

funding would be provided on the basis of financial need, and only if not available from another source. Loans would provide up to 75 percent of the total cost or \$750,000, whichever is less.

The legislation would authorize \$45



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

million in fiscal 1994, and \$37.5 million for fiscal years 1995, 1996, and 1997. A date for floor action has not been set.

Final regulations on College Facilities Loan Program published—The Department of Education announced amendments to the College Facilities Loan Program August 10 (see August 10, 1993 *Federal Register*, p. 42626). Changes to the program include revisions in the selection criteria and a reduction of the maximum loan level from \$3 million to \$2 million. The College Facilities Loan Program provides low-interest loans to institutions of higher education or higher education building agencies to construct, reconstruct, or renovate housing, academic facilities, and other education facilities for students and faculty. A college may make only one loan application in five years, unless the loan is for use reconstructing facilities damaged as the result of a major disaster. The projected effective date of the regulation was

September 24, 1993. For further information, contact Sarah E. Babson, U.S. Department of Education, 400 Maryland Avenue, SW, Room 3022, ROB-3, Washington, DC 20202-5339; 202-708-6865.

ADA News

Joint notice of proposed rulemaking issued by the Department of Justice (DOJ), the Architectural and Transportation Barriers Compliance Board (Access Board), and the Department of Transportation (DOT) on detectable warnings—(See July 9, 1993 *Federal Register*, p. 37053). Under Section 504 of the Americans with Disabilities Act of 1990 (ADA), the Access Board is responsible for issuing guidelines to assist the DOJ and DOT in establishing accessibility standards for certain titles of the act, including requirements for building signage and detectable warnings for individuals who are blind or have low vision.

Under the Americans with Disabilities Act Accessibility Guidelines (ADAAG), detectable warnings must be applied to walking surfaces to warn individuals with vision impairments of hazards on a circulation path. These warnings consist of small truncated domes at closely spaced intervals and contrast visually with adjacent surfaces. The ADAAG requires that detectable warnings be provided at

- Curb ramps;
- Hazardous vehicular areas (where walks cross or adjoin vehicular ways and there are no curbs, railings, or other elements separating the pedestrian and vehicular areas);
- Reflecting pool edges that are not protected by railings, walls, or curbs;
- Platform edges in train stations that are not protected by platform screens or guard rails.

Since the ADAAG was issued in July 1991, several developments have caused the Access Board to further consider the requirements for detectable warnings. As a result, the Access Board plans to conduct additional research in response to potential safety concerns raised by organizations representing individuals with disabilities and entities covered by the ADA. Therefore, certain requirements for detectable warnings are temporarily suspended until January 26, 1995 while the research is conducted.

For further information contact James J. Raggio, General Counsel, Architectural and Transportation Barriers Compliance Board, 1331 F Street, NW, Suite 1000, Washington, DC 20004-1111; 202-272-5434 or 202-272-5449 (TDD).

APPA offers free on-line legislative and regulatory news—APPA members, do you have access to Internet or Bitnet? If you do, you can subscribe to the on-line APPA Government Relations Update at no charge! The bulletin comes out every Monday when Congress is in session. To be included on the distribution list, please leave a message directed to my attention on the "subject" line at APPA@BITNIC.BITNET or APPA@BITNIC.EDUCOM.EDU. In addition to your e-mail address, please provide your name, address, and phone number for our records. ■

CRIME SHIELD® WINDOW BARRIERS



PHYSICAL PROTECTION

Hard to get in. Tough metal membrane, unitized construction, and concealed hardware combine to offer superior safety. Strong visual deterrent.

LIFE SAFETY

Easy to get out. Firelife safety is not compromised. Quick-release, 1-point latch operation. Tamper seals deter unauthorized use. Alarm option.

ATTRACTIVE

Design and color options blend with—or enhance—any building. Visually unobtrusive... as light and airy as insect screening. 63% open for light & air!

AFFORDABLE

High value and performance. Superior quality, low maintenance. Reduces glass and screen replacement. Simple, fast, flexible installation.



243 W. Eighth St.
Wyoming, PA 18644
717-693-4220 • Fax 693-2575

U.S. Patent #4,991,147, #5,096,262; design patents issued.
Lexeter, Lexeter logo & Crime Shield are trademarks
of Lexeter Architectural Products, Inc. © 1992

Member - National Fire Protection Association
Sponsor - Campus Violence Prevention Center

Focus on Management

Control, but Don't Overcontrol

Sigmund G. Ginsburg

Control is an important aspect of management and is related to several other management functions such as planning and budgeting. In fact, every management function and area requires various levels of control. In an ideal world everything would go as planned and as set forth in policies and procedures. In the real world, actions or inactions of individuals and units, the efforts of competitors, internal forces in the organization, and external forces acting upon them may make it impossible or very difficult to carry out well-designed plans and procedures.

Controls seek to ensure that results conform to established objectives. To be effective, a control system involves

1. Establishing performance standards with sufficient specificity so that actual results can be measured against them.
2. Monitoring and measuring performance and comparing the verified results to the standards previously established.
3. Taking action to correct deviations from the standards set and the planned objectives.

It would be easy to set up a tight sys-

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.

tem of controls. However, one must evaluate the control system in terms of whether it is cost effective. Are you spending \$100,000 on controls to prevent possible fraud totaling \$1,000? Are the controls so burdensome and picayune that they slow the accomplishment of your objective, damage morale and incentive, harm relations with customers and suppliers, and so on?

In essence, you want effective controls that are logical and simple to understand, are flexible and responsive enough to adapt to changing circumstances, are focused on exceptions to the expected, are at critical points for evaluation, and are tuned in to the organization's structure, style, and needs. No control system will work unless there is effective leadership and a reporting system that is objective, accurate, and timely and reaches the right people at the right time so that the information is useful and corrective action can be taken.

The effective manager will balance the need for control systems and reports with an understanding that people may lack knowledge of or disagree with the performance objectives, the standards and measurements, or the control system's goals. This can be overcome by discussion with those involved and, if possible, agreement as to goals and controls.

An effective control system requires more than controller's traditional green eyeshade approach or the latest and most powerful information technology and monitoring devices. The carefully designed and discussed control system can accomplish the goals required of such systems, while at the same time bringing a bonus to management and the organization not usually associated with controls.

Including those affected by the control system in its design, implementation, and evaluation also has the added bonus of demonstrating concern for their creativity, flexibility,

motivation, and satisfaction. Furthermore, such an approach would indicate a commitment to the need for communication and cooperation in achieving the organization's objectives. ■



Facility Management Automation Consultant

Purchasing or upgrading a computerized maintenance management system? Are you a bit wary of the claims made by the 200+ software vendors?

Do you want focused, straight-forward recommendations to help you choose the lowest cost applications that will really meet your needs? Call me. Find out what works, what does not, and why. I sell no software, so providing you with an impartial solution to your needs is my sole interest.

Howard Millman
Data Systems Services
914-271-6883

Perspective

Contracting for Facilities Management Services: An Ethical Dilemma

by Alan L. Ingle, Ed.D.

A long-standing question exists relating to the problem of determining the best way to accomplish college and university facilities management services. Should services be provided, as in the past, utilizing personnel on the institutional payroll, or should services be contracted to the private sector, as has been the case in increasing instances during recent years?

As part of the founding doctrine of American higher education, the basis for public service operations in universities and colleges, has always been to expect public services to be performed by internal public servants. These public servants are expected to perform at a high level of ethical conduct and with a high degree of effectiveness. Unfortunately, the record shows that a combination of perceived "rights" of the work force to criticize policy—and the opportunity to be closely involved in the business of how to perform the work to be done—has sometimes worked against the concept of efficiency, and costs have not kept pace with private sector pricing.

During recent years, as population has increased and technology has become more advanced, the need has

Al Ingle is assistant vice president for facilities operations at the State University of New York at Stony Brook. He received his doctorate in higher education administration from West Virginia University.



Ted Benson

also become more critical for service activity aimed at updating college and university facilities in order to keep pace with the times. With these fast-paced changes comes an economy plagued by periods of inflation and unemployment. We have seen a continued interest and demand for improved services, while at the same time we have seen the continuation of a troubled revenue base unable to support the programs involving increased service requirements.

Reluctantly, college and university administrators are turning to innovative ways to provide improved services more economically, while striving to maintain quality and deliver services in a timely manner. While the concept of efficiency and effectiveness has been paramount in the establishment of operations, the critical and real issue of economy has dictated the prevailing method of operation. Contracting for services has become a reality. The

administrator is faced with the question of how to optimize on price, quality, and delivery, while protecting the extremely important element of equity for the public servant.

The contracting out of services requires administrators to understand the scope of responsibility inherent in making such decisions. The administrator should consider the advisability of continuing past practice of performing services utilizing in-house employees, or exercise their discretionary authority in allowing outside private execution of services.

The values associated with providing efficient and effective performance as an obligation are critical in the administrator's analysis. These values are emphasized in physical plant organizations as being critical to the success of the organizational mission. Each administrator, depending on personal values, will be affected by feelings of

guilt if services are contracted out and in-house service personnel must be terminated. Under certain conditions, pressures related to the continuation of services provided by in-house employees at a premium price may also be extremely strong for the administrator.

The Ethical Dilemma

The administrator must decide between the continuation of services through the use of direct service employees or the more complex process of contracting out for services. The administrator, while possessing unique personal values, will to some extent, consider humanistic concerns for public servants, and organizational loyalty. Due to these values, among others, two alternatives will exist each time the administrator is faced with the decision.

Continue the practice of performing the services utilizing service employees.

Providing jobs for the in-house workers and ensuring quality service completed in a timely manner while on average spending a greater amount of money, further limiting the amount of service that can be provided to the community.

Contract out services to private enterprise. Receive specified service at an agreed-upon price, while forcing a reduction in service personnel and running the risk of receiving less than satisfactory quality in services provided in a time frame that is uncontrolled and possibly unacceptable to the community.

Each administrator will be affected to varying degrees, depending on perspective, by questions pertaining to the importance of quality of service performed and the timeliness of completion. Of utmost importance to most administrators is a commitment to the highest possible level of service. In many cases, the highest level of service may be equated with the best quality and delivery regardless of price, rather than a blending of all criteria in the "real" interest of the community.

Of major concern in the decision will be the well being of service personnel and related matters pertaining to the consequences of dismissal in the case of contracting out. The problems involved in reduction by transfer and attrition or who should be "laid off" and how layoffs should be handled, complicate this issue.

Recommended Strategies

The decision to contract for facilities management services must be accompanied by a well-defined program of ethical considerations in the plan of action. While each case will be unique, certain basic considerations must be the focus of attention.

The future of service personnel. The fair and just treatment of service personnel must be paramount in any decision. Acceptable "lateral transfer" or other means of compensation should be considered when a position is no longer needed due to the use of private service organizations. Reduction in ser-

ABM has their MBA in Building Maintenance.



For over 80 years, ABM has majored in providing high-quality contract building maintenance services. An advanced degree of quality without the high cost.

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 demands of your campus ABM contract custodial, engineering services and grounds 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 you 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
Fax 415-597-7160

vice personnel by attrition should also be utilized when possible. The financial gains that can be made through contracting out will be minor if losses in the morale of remaining personnel are incurred due to improper handling of issues involved.

Analysis based on public interest.

Prior to proceeding with any program of contracting out, a review of the public interest (college and university community) in the matter should be completed. Analysis of matters internal to the facilities management organization cannot be sufficient as decision criteria. Some form of outside intelligence gathering is required to obtain the pulse of the constituency being served. Their input related to satisfaction with current service, optimum levels of service needed, and preferred methods of implementation is critical.

Consideration for quality and control. The "opportunity cost," including questions of inferior quality, delays in performance of service, and general

loss of control are major impact issues. The administrator should explore the climate for success in privatizing the public work. Exploratory proposals should be requested to check the extent of cooperation to be expected and the availability of qualified, reliable private contractors. To forfeit quality and control is unacceptable.

The strategies available to the administrator in this matter are extensive, but all must include an emphasis on the administration of a just and equitable outcome for all concerned.

The Process

In considering procedural issues, most conscientious administrators will try to apply processes that produce fair outcomes. The administrator must also be sure that the processes used to reach the outcome are fair. This is an extremely difficult and uncertain undertaking. However, certain basic concepts can be utilized to help to ensure success.

Accuracy. In order to create the best possible position in a matter as complex as contracting out, the administrator should take time to ensure to the greatest extent possible the accuracy and correctness of studies conducted and processes put into effect. If matters are treated with accuracy, a greater chance for justice for all will result.

Equality. In the process of developing the programs related to contracting out services, all parties, the affected workers as well as the general community and the agencies involved, must have equal access to all information. This applies as well as to those administrators responsible for compiling information and making decisions. In order to ensure equal consideration for all methods of operation, equal access to information is extremely important.

Openness. The administrator should maintain a large degree of openness with all parties with interest at stake. The "transparency" or ability to be understood is an extremely important concept in undertaking the successful initiation of the program.

Humaneness. During the entire process, individuals involved should have a sense of respect and dignity for all parties in carrying out the research and resulting programs. Strategies utilized should enhance the position of

individual dignity. Each person, whether part of the general public, contractors involved, or public work force participating as employees, should be treated appropriately to ensure humanistic outcomes.

Although in many cases the above factors related to processing the programs may be in conflict with each other, the administrator can best serve the college or university's best interest and ensure the greatest possible fairness by keeping in mind positive achievement in areas identified.

Summary

The issue of contract management or self-operation is volatile in nature. As a result of facilities management department actions, the community may enjoy high quality facilities and services delivered in a timely manner with competitive prices, or they may be forced to endure inadequate facilities and services improperly delivered at inflated prices. The potential contracting companies may enjoy the possibility of working for the institution or continue to forfeit the business to in-house workers.

When considering contracting out, the administrator must conduct himself or herself in the most just and ethical manner for the facilities management mission to succeed. In the final analysis, the efforts of the administrator should be to bring about an outcome that may not be the panacea, but will produce a viable system that permits a combination of facilities and services provided by joint efforts of contractors, in-house workers, or both. To expect exclusivity of one or the other is to promote and/or condone an unjust system of facilities management. ■

IT PAYS TO REPAIR



We repair all types of pneumatic thermostats, flame safeguard controls, modutrol motors and all types of electronic controls.

For more information, call 800-248-3491.

ENERGY CONTROLS, INC.
1355 Park Road
Chanhassen, MN 55317

20 Years of Service!

The opinions expressed in Perspective are those of the author and do not necessarily reflect the opinions of APPA. Send your replies to this or any other article to

Editor, *Facilities Manager*
1446 Duke Street
Alexandria, VA 22314-3492

fax: 703-549-2772

e-mail: appainfo@cni.org

On Time. On Budget.

D&L Program Management provides the control you need for a successful project. Using our proprietary control systems, Project OverseerSM and Construction OverseerSM, D&L provides the planning and coordination required for precise project control. With D&L as your representative, you can be assured your project will be on time and on budget.

In addition to Program

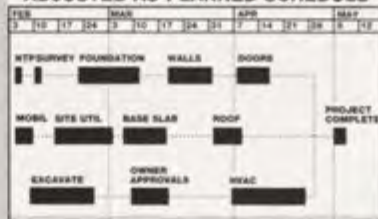
Management, our broad range of services include engineering, design, interior planning, capital cost estimates, scheduling, project control system development and implementation, design drawing review and technical evaluation.

D&L will manage your next project effectively and economically from start to finish. On Time. On Budget.

For more information, call today.

**Find out how D&L
Program Management
can save you time
and money on
your next project.**

ADJUSTED AS-PLANNED SCHEDULE



Pittsburgh
(412) 763-3643
FAX (412) 763-0905

Philadelphia
(215) 625-2850
FAX (215) 625-2859

Birmingham
(205) 788-0934
FAX (205) 788-3508

Gary
(219) 949-8233
FAX (219) 949-8244



Space planning



Industrial facilities



Interior design.

A Centralized Chilled Water Plant for a major university.

The Southern Style *of* Diane Kerby

by Pauline O. Hovey



Originally from Tennessee, E. Diane Kerby describes herself as a "typical Southerner." But there will be nothing typical about her term as APPA's new president. It has been almost twenty years since APPA's president was a director from a small college. As the director of facilities management at Berea College, Kerby will bring special insight into the problems that face small colleges and universities. In addition, she will serve as the association's first woman president.

Diane Kerby checks on construction of a new student family housing addition on the Berea campus. With her is Maintenance and Construction Supervisor Cron Carpenter.

Berea College, located about forty miles south of Lexington, Kentucky, is in itself atypical. The college charges no tuition to its 1,500 students, many of whom come from the southern Appalachian area. Although the students may have financial limitations, there are no limits to the talents and gifts they offer Berea and the community. While enrolled full-time, the students work ten to twenty hours per week in a labor program that not only assists with expenses, but teaches them values and skills while providing service to the community.

Kerby can personally attest to the value of the labor program. As a student at Berea in the 1970s, she held a variety of positions until, while working on a summer renovation project, she was offered a job in what was then called the buildings and grounds office. That introduction to the field of physical plant management changed Kerby's direction. What was intended to be a temporary job while she searched for a "real job," instead turned into a career. Kerby credits supervisors who "recognized whatever potential I had and encouraged that and gave me new and different challenges." As a result, she decided to remain in facilities management and completed a second degree in business, which she thought would be more applicable than her B.A. degree in child development. In 1981, Kerby became associate director, and less than four years later, she was named director of facilities management of the college.

Because Berea is a small college and does not rely on tuition to meet expenses, one wonders if Kerby's department has difficulty attaining much-needed funding. But that has not been a problem, due to excellent fund-raising efforts and a substantial endowment. As with any college, many programs vie for operating money, but Kerby explained, "We have been fortunate in that the leadership of Berea and the administration here, with the college trustees, recognize the importance of maintaining and building the facility. The budget just increased over the last cycle over \$350,000 just to keep up with the demand."

Of course, Kerby and her staff did their homework and educated the administration about the department's needs, but, she added, "the leadership had the foresight to do that. In terms of overall college budget, we do have to raise more operating money than most colleges or universities, but we do an excellent job of that because people believe in what Berea does—the whole concept." The college's commitment to service, she explained, "is more than just words on paper; it's a mission people here believe in," which makes raising money for the campus a little easier.

Challenges of Small Colleges

Although some of her colleagues say that Berea is not a typical small college because it has "great resources" and uses student labor, Kerby believes that "we do share a lot of things in common. We face the same kinds of problems and challenges."

Kerby knows firsthand that many small colleges are limited in resources and staff. As a result, the facilities manager picks up the slack. "Typically, a facilities manager of a small college has to be more of a generalist than a specialist," she explained. "We don't have an architectural staff or an engineering staff; we don't have specialty areas to draw from, so we have to be aware of and informed in all of those areas. We

have to do more with less." Her own staff of fifty-five, although supplemented by many student employees, maintains a 140-acre campus that includes a restaurant/hotel, gift shop, and museums.

This is part of the challenge for small colleges, Kerby said, and APPA has to help them meet that challenge by making educational programs affordable and more meaningful to the small college audience. In addition, the programs have to be accessible so that directors can attend without constantly traveling out of state.



"The need to know more means that small college managers are going to have to get that information from APPA, and I think that we need to provide that in such a way that is beneficial to them"

Understandably, increased responsibilities and small staffs make it difficult for facilities managers to be away from campus. Yet, attendance at professional training and other educational programs is vital to staying informed. "The need to know more means that small college managers are going to have to get that information from APPA, and I think that we need to provide that in such a way that is beneficial to them," Kerby said. She suggested that APPA devise more creative alternatives to long-distance education through telecommunications or more regional programs.

"One of the benefits of belonging to APPA is access to that information," Kerby said. "We just need to explore how to get that information to members more efficiently, whether that's through electronic access, which we're pursuing, or other means. That's the challenge to the various vice presidents, to come up with alternative delivery."

As the vice presidents consider this, Kerby will work with the Small College Committee, on which she served in the past, to identify other needs and issues.

APPA's Influence

In addition to having served on the Small College Committee, Kerby teaches at APPA's Institute for Facilities Management, and she developed and coordinated the Institute Special Program on Personnel Management. The Institute's three-track program concentrates on topics such as energy management, human resource issues, budgeting and finance, project management, and much more. Members spend an entire week focusing on a specific area.

The benefits of committee work and service have been only part of APPA's influence on Kerby's career. During a ten-year-plus association with APPA, many individuals also helped her progress. "Bill Middleton was the first person at APPA to encourage me to get involved," she noted. He asked her to teach at the Institute and then paired her with someone who could help her so that, as she put it, "I wouldn't fall on my face."

She also fondly recalled Henry Shelby from Tennessee Tech, "who told me about ten or twelve years ago, 'I think

Pauline Hovey is a freelance writer based in Alexandria, Virginia. She wrote the profile of Don Mackel for the Fall 1992 Facilities Manager.



Jeff Farthing replaces an alternator on a motor pool vehicle as he and Kerby compare notes on vehicle maintenance schedules. The department has 32 vehicles available for college employee use and 45 that are used for maintenance purposes.

you need to be the next president of APPA,' and he started working to make that happen. I have had people who have pushed and encouraged me and wanted me to succeed, and that has been really helpful."

Former presidents Jack Hug and Dorsey Jacobs, and many others, gave her challenges to meet, which Kerby said were crucial to her achievements—so crucial that she stresses the importance of mentoring as part of the 1993-94 Operating Plan. "We need to formalize a mentoring program as part of the diversity effort, but even beyond that, as a matter of helping each other. It's very important. It's been a key part in whatever success I may have had in APPA and in my professional career."

The association not only influenced Kerby's career, but helped Berea College and facilities managers in general, Kerby said, "by creating an awareness of issues such as capital renewal, decaying American campuses, and the fate of our facilities and the need to do something now." It made presidents and trustees "aware of the problem and their obligation to fund those needs." Because of APPA's efforts, "We participate on an equal level with the business officers and other higher education administrators, and I think that's really been very helpful," she added.

Diversity and Ethics

While devising the 1993-94 Operating Plan and updating APPA's Long-Range Plan, Kerby realized that many of the issues that past presidents faced "are still with us." But she regards APPA as a very strong association, one that has "stayed the course and followed that plan, and it's become a working document rather than something that was just put on the shelf." APPA's sense of purpose impresses Kerby, as does its planning process. "Back in 1989, APPA had the foresight to develop a long-range plan and identify the issues we're facing. A lot of time and effort went into identifying these issues and to establishing a mission."

Although the major issues of the mission have not changed, Kerby added the promotion of diversity and ethics to the 1993-94 Operating Plan. These two issues have personal significance to Kerby. "If I had to place emphasis on one thing in the Operating Plan, I do feel strongly about diversity," she noted. "It's more than an affirmative action program; it's a recognition that organizations are made stronger by including the talents of people from multiple backgrounds. It enlarges the talent pool and brings fresh ideas and fresh approaches to issues. Diversity doesn't just refer to gender or ethnicity, but also differences in age and physical challenge. I

think we will be stronger for including different people that accurately reflect the society at large in our decision making."

As a woman, Kerby knows about prejudice against diversity, but said, "You just do the best you can." She maintains, however, that some of the challenges of being a woman were self-imposed, because "sometimes I have a tendency to carry the whole burden of being a woman." She often puts pressure on herself by thinking, "If I fail or I don't do a really good job, it's not just that Diane the person fails, but that, 'We tried a



"I do feel strongly about diversity. It's more than an affirmative action program; it's a recognition that organizations are made stronger by including the talents of people from multiple backgrounds. It enlarges the talent pool and brings fresh ideas and fresh approaches to issues."

woman and that didn't work, so we're never ever going to do that again.' But females in this profession are not so much of a shock now," she said. "It's a lot more comfortable" for both parties.

Awareness of Issues

APPA members indicated in the recent member opinion survey that their highest priorities are energy management, customer service, environmental issues, and supervisory training, and Kerby believes the Operating Plan reflects those needs. She notes the series of supervisory training modules that APPA is producing. Regarding environmental issues, Kerby wants to evaluate the structure of committees and decide if further outreach programs are needed to disseminate compliance information.

But beyond these issues, Kerby sees "the whole attitude toward higher education" changing. "There's some criticism of higher education, that we've lost value and we don't produce the product anymore. Some of that's justified," she said, citing the problems of overcharging and rising tuition. "Those are things affecting our institutions that are obviously going to affect us as facilities managers. We are going to have to be accountable.

"As an association, we're going to have to explore some initiatives to participate in those broad policies that affect higher education. I don't think that we live in a vacuum; I think we really need to keep up on what's going on and be aware of issues, and somehow partner with other associations and other professionals in higher education in a way to understand what's going to come down the pike so we can inform our members."

Personal Challenges

On a personal level, Kerby finds her greatest challenge is working with people. "The whole aspect of dealing with people is challenging because you never get to the point that you've mastered that. Just when you think you've seen everything, something new comes up," Kerby said.

She finds the differences in people interesting and believes

Southerners have a different approach to problems. "The Southern way of dealing with things is not as intense," she explained. "It affords an opportunity to sit back and evaluate things. People have a tendency not to take things so seriously in the traditional South, where hospitality and openness are the norm."

Encouraging each other also seems to be a trait. Kerby often notes the support she has received at Berea. "I think my boss and my boss's boss and everybody else went to St. Louis when I became APPA president. It goes beyond support—it's enthusiasm, really, for what I'm doing."

In the same way, Kerby encourages her own staff. As a facilities management director, she would like to continue the efforts begun to train people and help them improve. "When it comes down to it, we as directors are not the ones who are actually doing the work. The single biggest challenge in the development of those folks is getting them to be the best that they can be. If you create a better whole person, you're going to get a better employee—people who think for themselves, and people who take initiative and work toward what it is you're trying to accomplish. It makes your job a lot easier, too."

And if her department makes a difference in one person's life, "that's a good way to continue to present a good case for adequately funding our physical resources. We place value on human resources as well as on capital. We are starting to place the same value on our physical assets, so I would like to continue that effort."

Current Challenge

Kerby perceives the current challenge as identifying the issues ahead. "How are we going to do that? How can we influence it?" Kerby asked. She speculated on the existence

of classrooms in the future. With the constant changes in telecommunications, "What's going to happen? We need to take some time to figure that out—to spend time looking into the future."

APPA faces many challenges, but Kerby believes the association is positioned to meet them. In her estimation, every APPA president has remained centered on the needs of the association and members in general, which Kerby said is crucial to continued progress.

"We need to keep focused on the issues as well as look toward the future and try to determine how the larger picture in higher education is going to impact us."



Kerby talks with student employees who work with departmental horticulturist in meeting their student labor requirement.

Strengthening the Role of Facilities Management in a Small Institution

by Keith H. Lovin

photos by Steve Glazner

After one year as president of Maryville University, I have acquired a new perspective on, and certainly a renewed and deeper appreciation for, the role of facility managers. Let me put it as simply as I can. You are, quite simply and quite literally, as key to your institution and as important to your president as any other person, any other vice president or dean, anybody in the institution.

The long-term well-being of your institution depends in substantial ways upon your work and your leadership. You are the custodians of our capital assets, which in turn house our academic programs, athletic facilities, and all the rest. And it is these programs and activities that produce the

intellectual, social, moral, and personal capital that we are in business to nurture and cultivate.

While it may be the quality of the academic programs and the quality of the faculty that attracts students to a campus initially, it is the quality of the environment, and the quality of the physical plant, its buildings and grounds, that plays a major role in keeping them there. With the competition for students as keen as it is today, it certainly is in our best interests to retain students once we have attracted them to campus in the first place.

There is no doubt in my mind that the appearance of the campus and the grounds have a disproportionate effect on prospective students and their parents, not to mention, of course, prospective benefactors. Countless times over the years, parents have talked with me about their son's and daughter's selection of a college, and have cited the appearance of the campus as a major, and sometimes the major, factor. And if all things are equal, it certainly will tip the scale. When you think about it, it really stands to reason



Dr. Keith Lovin became president of Maryville University of Saint Louis, Missouri, in 1992. He has taught extensively in philosophy and previously served as provost and vice president for academic affairs at the University of Southern Colorado. This article was taken from Dr. Lovin's keynote address presented at APPA's annual meeting in July.

that this would be the case. The three institutions that I was privileged to study at were places where I felt a great deal of pride and satisfaction because of the physical appearance of the campus. I would imagine that if you reflected on the places that you attended, you would feel the same way.

Moreover, the appearance of the campus and its grounds, along with the way that students are greeted and treated by everybody on campus, have an enormous influence on the institution's image and its reputation than the "objective quality" of its academic programs.

I am aware that these are very difficult times on most campuses. Severe cutbacks have taken place on top of years of underfunding. There are many states in which there is not only no money for needed new capital construction or major renovation, there is no money to deal with serious problems like asbestos removal. In some state institutions there are legislative appropriations only for the most extreme emergencies. And, of course, in private institutions we have no legislature to turn to, even in case of emergencies, thereby facing the challenge of having to generate sufficient operating funds to take care of our work during any given year, as well as generating the reserves to handle new capital construction and to deal with the inevitable emergencies that come our way.

In addition to the budget cuts that most of you have experienced, you are faced with costs that are attendant to the significant new compliance requirements, such as the Americans with Disabilities Act. You must find ways to accommodate what in many institutions are short-term financial policies that have caused deferred maintenance to accelerate at an alarming rate. Your work has been made more difficult still, because apart from new construction or major new renovation, there is no sex appeal in, and hence no media attention given to, simply maintaining and preserving beautiful buildings and grounds. You also must constantly contend with the great pressure to put more resources, both fiscal and human, into the teaching and the research side of the institution.

All of these things, and more besides, make your job simultaneously more difficult and more important. More difficult because the people, the equipment, the resources that you need to do your work are harder to come by. More important because it is your knowledge and your leadership that is required to steer us through these difficulties and to help us avoid the crises that some institutions are facing from coast to coast. I am sure you are aware that there are institutions facing annual budget deficits of \$50 million to \$100 million. We are talking about serious problems indeed.

Now, if you have a significant leadership responsibility here, how can you best start exercising it? Under what conditions could you best influence your institution in general, and your president in particular? I offer the following comments not as wisdom drawn from years of experience, but from the perspective of one president in office one year. I offer them also as a president who has had the extreme good fortune of having a director of physical plant and a facilities staff that I would not trade for any director or any staff in the United States of America.

It is critical that there be a good relationship between the president and the director of physical facilities. I suggest that you make the president know just how important, indeed just how indispensable, you really are in promoting the institution's long-term well-being. Help your president understand that whatever the institution's mission is, your operation is critical to its realization. And if you can become friends with the president in the process, so much the better. The closer

and more genuine the relationship that you enjoy with your president, the greater the opportunity that you will have to help educate and influence him or her about the importance of taking the long-term view. Remember, there is always great pressure on the president to spend more money in all areas of the institution. It is sometimes easier, it seems, to allow the facilities department to take the bigger hit, because it is not always as immediately noticeable. But long-term, I think that is very unwise.

I am convinced that it is this pressure, along with the shortage of funds, that has given rise to one of the most serious and difficult problems facing all of higher education, and that is deferred maintenance. The problem quite literally has reached crisis proportions, and we must somehow work together to find ways to replace the short-term financial policies that are in effect in so many places with long-term policies. We must recognize that too many

instances of deferred maintenance over too many years will result in the inevitable deterioration of the institution, if not its eventual demise. You need to take an active leadership role in helping the vice president to whom you probably report, and the president, understand this.

Of course, you must have a president who understands and appreciates the long-term view if you are going to be successful. I doubt that you disagree with this, but you may wonder how to get close to the president and how to exercise this influence. So much of this is a matter of style and personality. What will work in one place will not work in another. I will have to leave that to your own intuition and your own judgment. But there are some things that I think will be helpful and will influence your situation, regardless of the disposition of your president.

First, there is no substitute for knowledge, and there is no substitute for experience. If you do not truly and thoroughly understand your job in all of its diversity and all of its complexity, then you cannot influence your president, at least not favorably. I remember the first time that I complimented Pat Apel on the sparkling quality of our campus, grounds, and buildings. Instead of saying "Thank you" and moving on, or scratching his head and saying "Aw, shucks," he responded by quoting from the Carnegie Commission report about the importance of physical facilities in carrying out the academic enterprise of the institution, and he later sent me a copy of relevant portions of that report. I want to tell you that he could not have done better, because this demonstrated context. It showed me in a powerful and effective way that he has more than just technical knowledge and understanding; indeed he understands of the phenomenon of higher education itself.

Go to meetings, attend seminars, read the literature, keep up in your field, be an expert in your area. But if you really

There is no doubt in my mind that the appearance of the campus and the grounds are a significant factor.



Dr. Keith Loxin, fifth from right, and the Maryville facilities team.

want to influence your president, and if you really want to have a lasting effect on your institution, then you need to make it your business to understand the business of higher education in the larger sense. Remember that you are the experts to whom others will look for leadership. When the opportunity presents itself, demonstrate your technical expertise and competence, but do so in the context of the purposes, and the values of higher education in general, and your own institution's mission in particular.

Second, assemble a good team. Next to your own competence, your greatest challenge is hiring the people who can help you execute your responsibilities and fulfill your role at the university. No place is any better than the people who populate it. I suppose everybody assents to this in the abstract, but it never ceases to amaze me how little we seem to internalize that truth. But if you want your operation to make a significant difference, then you had better not forget it when you hire people.

When you hire people, invest the time to find those people who have the skills that you need in the present. But also find the people who have the capacity to grow and develop and thereby help meet your needs in the future. Also important is to try to get a sense of the person's attitude—how well that person will integrate into your team, the kind of cooperation that you can expect, the attitude that he or she will bring to the office and to work each day.

We can do a much better job in this area. After watching the way we fill position vacancies for twenty-three years, I have concluded that it is frequently done with little care or attention and is followed by consequences ranging from mediocre to disastrous.

This is another thing I have learned on my campus. I have seen the kind of staff that our director has assembled. The assistant director of our physical plant for buildings and grounds has an MFA degree. That is a pretty good preparation for bringing the kind of aesthetic understanding that is

desirable on campus. Our assistant director for technical services is an absolute whiz in energy conservation. We have a team of people assembled in part because of their expertise, but also in part because of their attitude and cooperation—the way they work with each other and get along with each other. I can tell you it makes all the difference in the world. If I had a magic button to push and could generate the same kind of attitude, the same kind of cooperation, in all other areas of the university, I would push that button in one instant.

Third, after you have assembled your team, educate them. They need to understand their role in the institution, and they need to be supported in fulfilling it. Sometimes we act as if it is only the faculty or the senior administrators that stand in need of continuing education. If we are to

prosper in an institution, then we have to create an environment in which everyone may and does continue to learn. It is your responsibility to find ways to teach them.

Years ago, after a celebrated international career on the stage, the world famous violinist, Jascha Heifetz became a professor of music at UCLA. When someone asked him why he had left the glamorous world of performance to become a teacher, he said, "Violin playing is a perishable art. It must be pursued and passed on, otherwise it is lost." I submit to you that your work is a perishable art, and you need to teach your team how to accomplish that work.

Fourth, consciously and deliberately think of yourself as the manager of a large and complex operation, because that is exactly what you are. This means that you have to hone your skills in long-range planning, financial management, team development, motivation and evaluation, priority setting, and communication, both within and outside your shop. Those things do not happen just by accident. When I walk into the facilities office on our campus, I am reminded of the television show *Hill Street Blues*. Remember all of the chaos and confusion? Phones ringing off the wall, countless problems popping up large and small, emergencies that won't wait, disgruntled people, everybody thinking their problem is the most important, and all of this is on top of a regular caseload that in itself would fill up any day. And there was Captain Furillo in the middle of it all. He was making decisions, dispatching people, readjusting priorities, calming some people down, prodding others to work harder, comforting others. It seems to me that your job is very much like that. That is the way it is on our campus, and the analogue of Captain Furillo is Pat Apel and Donna Grebe, the office manager. They are in there with good will and good humor dealing with all of this chaos, and it is both a beauty and a joy to watch.

Fifth, if you do not have a thick skin, I suggest you try to develop one. There are skeptics and critics everywhere. On the one hand, if you do your work when classes are in ses-

sion, then you are totally insensitive to the interests of students and faculty members and the academic enterprise, disrupting it to serve your convenience only. And yet, if you wait until the summer break to do this work, it's because you and the senior management always wait until the faculty is away from campus to make decisions and spend money. You are not going to escape this, so learn to live with it and do not worry about it, because you cannot make everybody happy.

Somebody told the story of Robert Fulton who was showing off his new invention, the steamboat. People were gathered to watch it, and the skeptics there were shouting, "It will never start! It will never start!" Finally, after a lot of clunking and chugging, it did start and began to make its way down the river. The skeptics looked at it for a while and then they started shouting, "It will never stop! It will never stop!" So do not worry about those people.

Sixth, because of the scarcity of resources, and this is not going to improve, you can impress and influence your president by being an innovative problem-solver. There was a great German chemist by the name of Johann von Baeyer who won a Nobel Prize for his many contributions to science. One day his assistants had developed an ingenious stirring device that was operated by water turbines. He was quite taken with that machine and eventually he showed it to his wife. She looked at it for a while in admiration and then exclaimed, "Ah, what a lovely way of making mayonnaise!" You need to understand the difference between innovation and invention, and you need to find all kinds of ways for making mayonnaise.

I remember once when an architect visited campus. After lunch we were walking around campus, and I was talking about some of my fantasies and long-term dreams for the institution—trying to get a reading of whether it was doable or not. When all that was over I ran into Pat Apel and told him about it and a couple of problems that had come up. And he said, "Oh, this is how you can deal with that." When you find new ways to make mayonnaise, I guarantee you will impress your president.

Remember the words of Charles Kettering, who said, "The only difference between a solution and a problem is that people understand the solution." It is said that Thomas Edison had an interesting way of judging people. He would sometimes give applicants for positions a lightbulb, and he would ask them to determine how much water it could hold. So some of them would take a bulb and would determine the angles and make measurements to determine the surface area and then calculate the volume of water it would hold. Others would just fill it with water and pour it into a measuring cup, taking only a few seconds. Edison was said to have preferred the latter. So do I.

Finally, because of your association with so many people, both on and off the campus, you have the opportunity to be a goodwill ambassador for your institution. Your association with, and the respect you command from, people in your community—architects, engineers, consultants, vendors, and contractors—it is critical in determining how your institution is viewed, thought about, and perceived by the external

world. Your president will rely on you in this area more than you will probably ever know. But in addition to that, on your own campus you have the opportunity to do something of extraordinary significance. You and your staff will come into contact everyday with students, faculty members, legislators, trustees, prospective students, and parents of prospective students.

At Maryville we try to be a people-oriented university with a student orientation that is second to none.

Now, given your contact with all of those I just mentioned, you have the opportunity to influence how people think and feel about the campus and about being on it in really significant ways. Marshall Field said that goodwill is the one and only asset that competition cannot undersell or destroy. If we want to have a collegial environment on our campus, it is not something that can be entrusted only to the faculty. It requires the active participation of all members of the community. Promotion of goodwill and collegiality is something I suspect we tend not to think about nearly enough. There are few things, however, that could better serve institutions than to make sure that students and all visitors to the campus are greeted warmly and treated decently. That is the kind of attitude and the kind of behavior that generates pride in the institution. Without pride, an institution cannot be

You have the
opportunity to do
something of
extraordinary
significance.

healthy and vital.

What I have tried to suggest to you is that our facilities and their maintenance, preservation, and appearance are not just important, but indeed are critical to fulfilling the institution's mission. Your leadership is required and needed now, more than ever before. Your leadership can be most effectively utilized and benefited from when there is an excellent working professional and, indeed, personal relationship between you and the business vice president and the president. Where this exists, your work will not only be important, it will also be fun.

The competition for resources and the pressures to allocate them in varying ways will not go away. But a business exercise may provide instruction on how we should proceed. Ask someone to draw an imaginary line on the floor and place people on both sides of the line. The purpose is to have one person convince the other to cross the line. I am told by people who have done this, that in the United States people seldom succeed in getting the other person to cross the line. But our Japanese counterparts simply say, "If you will cross the line, so will I." They exchange places and they both win. I know that times are difficult, but if we can see ourselves engaged in an enterprise collectively and cooperatively, we can survive these difficulties and do exceedingly good things for higher education.

I have been taught and instructed by people on our campus far more than I could have imagined a year ago. I hope that I have been a good student and a good learner. I leave you with this: A few weeks ago I saw a television program about gorillas. The moderator said in the postscript that we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught. Teach us.

Learning from Success & Failure in Quality Management

by J.T. Petillo



[Ed. Note: In 1989, Florida Power and Light Company made a successful challenge for the international Deming Application Prize. The author was directly responsible for three organizational units that received audits conducted by the Union of Japanese Scientists and Engineers during the Deming examination.]

A lot of people talk about change, but I am going to talk about it in specific terms as it relates to those of us who are practitioners of this thing called quality or TQM (total quality management). At Qualtec Quality Services and Florida Power and Light

(FPL), we have brought together what we think is a wonderful mixture of practitioners of TQM. So I am going to talk about change as it relates specifically to FPL. I also want to talk about change in the larger context, as well as the management philosophy context in which TQM resides. TQM is nothing more and nothing less than a management system. There is no hocus pocus to it. You can call it anything you want, but TQM just applies

some fairly straightforward and logical things to do in a certain order.

Change, in the larger context, is also about entitlement—U.S. employees tend to think that they have a job for life; that they are deserving of a salary increase every year that at least equals the consumer price index. That kind of a context is what we, as managers, are trying to lay across a management system. In our case, we happen to call it the Quality Improvement Program. The larger generic title, TQM, is applied to a lot of what we are doing. However, it needs to be applied in a special way that makes sense to any organization that is applying it. We all need to understand change in the context of doing what fits your organization best. If there are

Tom Petillo is president of Qualtec Quality Services, Inc., an FPL Group company located in North Palm Beach, Florida. QQS provides training and consulting activities in total quality management and related disciplines. Petillo previously served as senior vice president for external affairs at Florida Power and Light Company, and he remains a member of FPL's board. This article was taken from Petillo's keynote address at APPA's 1993 Educational Conference and 80th Annual meeting, held July 25-27 in St. Louis, Missouri.

some tidbits in this discussion that might help you, then perhaps you might be able to manage better in a kind of environment that we are looking forward to and that all of us will face, as we go forward through the 1990s and into the next century.

Several publications have written that Florida Power and Light has scrubbed TQM. What I would say to you is that Florida Power and Light Company has started applying a graduate, more advanced, version of total quality management. If you expect to get to that more advanced version of TQM, then you are first going to have to do some pretty basic things, very similarly to what we had to do. It is impossible to make that leap without applying some basic principles.

Speaking of change and the pressures it brings, I really do not think that it is much different—public versus private sector. Whether you are at a public or private institution, you are dealing with some very similar pressures: How do we get the most out of limited resources? How do we empower people to make a difference? How do we serve our customers better?

I wonder how many of you have asked the tenured professors at your institutions if they have done a customer satisfaction survey on their customers, who happen to be the students. I suspect not many of your tenured professors see those students as customers of what they do. Nevertheless, it is a pressure that we are all under. We also all feel the pressure of reducing unnecessary bureaucracy within our organizations.

TQM and Quality Improvement

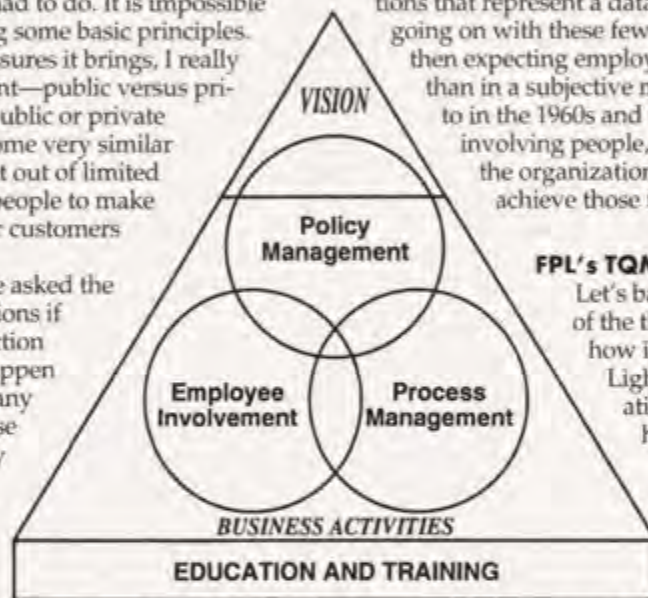
I would like to relate a story that I love. Once there were three patriots who were to be shot at sunrise—a French national, a Japanese, and an American. As the story goes, these three were called together the night before the execution and were asked, "Is there one last request?" The Frenchman said, "If I could possibly have a fine Bordeaux wine from my native country, perhaps a 1966 Margeaux; if I could have that, that would be my last request." The Japanese came forward and said, "My last request is to give one last speech about quality." And the American, upon hearing that, then said, "My last request is to be shot before the Japanese." Well, I am going to give you one last presentation on quality improvement and try to keep you from walking out the back door.

TQM, or quality improvement as we call it, has three basic components. The first is policy management or policy deployment, which is focusing the entire organization on a vision and on a few priority activities that the organization faces. The second element is training employees to be able to focus on those few priority activities. And the third element is something we call Quality in Daily Work, QIDW, which is something that is now starting to be called process management. Process management determines how best to offer con-

tinuous improvement to those micro processes; presently, some are talking about applying this to macro processes.

These three points deal in the total arena, applying the word "total" to looking at what the priority activities are: total as it is applied to teams, having all employees involved in solving problems, and looking, in totality, at all of the processes that go into that organization.

There are four principles that we talk about: 1) *customer satisfaction*—focusing on what the customer says they want and need; 2) *plan, do, check, act*—the so-called Deming Wheel of Continuous Improvement; 3) *speaking with data*—asking questions that represent a data base understanding of what is going on with these few significant priority activities—then expecting employees to respond with data rather than in a subjective mode that so many of us were used to in the 1960s and 1970s; and 4) *respecting people*—involving people, making them feel a part of what the organization is about, and moving forward to achieve those few priority activities.



FPL: TQM at the Graduate Level

© 1993 Qualtec Quality Services, Inc.

FPL's TQM Application: QIP

Let's back up to policy management—one of the three points of TQM—and look at how it was applied at Florida Power and Light Company. First of all, the creation of a vision for an organization has to come from the leader of that organization. Back in 1984, our then-president and his quality council evolved our corporate vision. It said that during the next decade, we want to become the best managed electric utility in the country, an excellent company overall, and to be recognized as such. This came to be known as the "best managed"

vision. We were to become the best managed electric utility, and that is how we talked about it.

After determining a vision, we listened to our customers. We talked to our many and varied customers—both the direct customers of our company, as well as the indirect customers, such as the Florida Public Service Commission, the Environmental Protection Agency, and the Nuclear Regulatory Commission. We distilled all the responses and reviewed the top five priorities as described by our customers.

First of all, the customers said that public safety was, without a doubt, the number one priority. Second, keep the price low and affordable. Third, our customers want considerate customer service. When they call us, they want someone to answer. They want that person to be polite and responsive to their needs. Fourth, they want good, reliable service; they want the lights to stay on and not even blink. The last thing customers said they want us to provide is a fine employee safety program to keep them working safely.

In going for the Deming prize, the critique that we got from the JUSE (Union of Japanese Scientists and Engineers) examiners said that we did policy management very well, but that

process management was our weakest element. We got good feedback from our Japanese friends, and we set about improving those areas as we got on the other side of the Deming prize. When we last measured the "best managed" indicators and benchmarked them with our sixteen peer companies, we had moved ourselves all the way from the thirteenth position to number two. Winning the Deming prize let us feel that we had achieved our vision of becoming best managed.

The Changing Business Environment

But then a funny thing happened on the way from the Deming prize. Jim Broadhead became the CEO of FPL's holding company in early 1989, as we were going through the Deming exercise. Jim had been president of the Telephone Operating Group of GTE and had a lot of experience in this brave new world of competition and deregulation. When he came to us he saw a lot of bureaucracy and paperwork, even as we were keeping our focus purely on the customer.

As we look back on the 1980s, it really was enough for us to understand our customers. In fact, it was fairly unique for an electric utility to understand what the wants and needs of its customers were. Most utilities were still operating in a paradigm that said, "We will keep the lights on and you pay us the bill, and anything else requested is extraneous." But all in all, we were a still a regulated utility. We were monopolistic, and we were operating in that kind of a business environment.

What Jim Broadhead was able to bring to our company was a vision of what the 1990s were going to look like, particularly coming from the telecommunications industry. He saw a threat of competition and of deregulation. In fact, just last year, Congress passed the Energy Policy Act of 1992, which created a status of generators called exempt wholesale generators. This means that those generators are exempt from the Holding Company Act and a number of the onerous regulations that date back to the 1930s and 1940s in the electric utility industry. It opened our transmission system to any and all comers who wanted to sell electricity at wholesale across existing transmission systems. We think that retail sales can't be far behind for both our transmission and distribution systems.

We are looking at an environment that is much "greener" than it has been in the past, a revitalization of the environmental movement. We are seeing global warming and acid rain as publicly debated issues. In Florida, wetlands legislation and mercury in the environment are major issues that we have to face as a company. And we are seeing amazing technological breakthroughs. We are seeing voice-response units, electronic banking, remote meter reading. Things like that cause us to realize that we are going to have to change.

So it is not enough anymore simply to listen to the "voice of the customer." The Japanese taught us very well in this regard; they do a wonderful job of translating the voice of the customer into products and services. But there is something equal to the voice of the customer, and that is the "voice of the business." The business environment in which we are operating has to be listened to and plugged in. In 1989, it was that voice of the business that we began to listen to—this competi-

tive, deregulated voice. We set about using the wonderful tools and techniques that we had acquired during the seven or eight years leading up to the Deming and applied them not just to the voice of our customer, but also to the voice of the business environment.

Our new vision stated that we would be the preferred provider of safe, reliable, and cost-effective products and services that satisfied the electricity-related needs of all customer segments. We went from a "best-managed" corporate vision to a "preferred-provider" corporate vision. Listening to the voice of the business, as well as that of the customer, brought us to what I would consider a more customer-oriented corporate vision, a preferred-provider corporate vision.

Restructuring

Once we had defined our vision and determined what some of our priority activities needed to be under that new vision, we realized that organizational restructuring would be necessary. The final question here was how would we be staffed to carry out the preferred-provider corporate vision. Again, we used the team environment. Now a very select group of twelve employees, together with the consulting firm of Booz-Allen, came together for several months and looked at how we ought to be organized and staffed to carry out that vision. The charge given to that group was to start with a clean sheet, much like reengineering, though reengineering principles were not vigorously applied in this instance.

Starting with only the customers and the business environment that existed at the time, how would you attain, through organization, and staffing, a preferred-provider vision? The dramatic recommendations were that we would essentially fire the entire organization, some 16,000 positions at that time, and begin to create a new organization from the top down.

First, there were some sixteen boxes in the direct reports to the president and the chairman; they went about selecting people to fill each of those sixteen boxes. Those of us who were in those sixteen boxes then, again with the help of the team, drew our next layer and went about staffing that next level of the organization. And that cascaded down through the organization. Believe me, it did not cascade nearly as far as the old organization would have suggested to you, because we went from a maximum of some thirteen layers of management to only six layers. When we restaffed the entire organization, there were slightly more than 2,000 positions out of 16,000 that were not included in the new organization.

The guiding principles of that restructuring resulted in a less bureaucratic, much leaner machine. At the same time, we were much more customer-oriented than we had ever been in the past; the principles of the reorganization started with an orientation to the customer.

The second principle was accountability. We talk a lot about accountability and how you want to push decision-making down to the lowest level of your organization. That certainly is what we were trying to do, but let me give you an example of some of the worst that was represented in not pushing decision-making down. In our old organization, leading up to and just before the Deming, we had some 8,246 written procedures. These procedures were written in 101 volumes, so if you had a complete set of FPL procedures, you

needed a couple of bookshelves to put them in. I suppose the expenditures for furniture even went up, just to accommodate 101 volumes of written procedures. We had a procedure for raising the stars and stripes; no, actually we had two procedures for raising the flag—one procedure for raising it at our Miami office and one for raising it at our Juno Beach office. We had a procedure if you got sick at work. We expected you to go to the procedure manual, pull it out, and find the procedure for going to see the nurse when you were sick. These are a few of the extraordinary examples of the kind of paperwork that we found ourselves mired in.

This was an internal auditor's dream. The department that kept all of these procedures comprised some fifteen employees who did nothing other than keep the procedures manuals updated. Not much accountability there. They dictated a follow-the-book type of structure.

Thirdly, we were a risk-averse organization. We had articulated a goal to the Florida Public Service Commission—and for that matter, the commission had agreed with us on this goal—that we would keep the growth in our operating and maintenance expenses to less than the percentage increase in the consumer price index, plus the percentage increase in customer growth. So, in the early 1980s when there was 12 percent inflation and we were experiencing 4 percent customer growth, if we could hold our increase in

operating expenses to 16 percent, we were meeting our goal and we were meeting the commission's goal. Today, we have thrown that out entirely. Not only do we not meet both, we do not meet either one, and in fact, in 1992, we were \$60 million less than we were in 1991 on a base of about \$1.2 billion. In 1993 and 1994 we will carry that to \$100 million less than we were in 1992. So there is a real effort to ask people to take risks to hold those kinds of O&M cost increases to zero, and in fact, to significantly reduce costs.

Implementation of all of this took us into the early part of 1992. Then on August 24, 1992, we faced what you might call the ultimate test of quality. It was in the form of Hurricane Andrew, and in the face of that hurricane we did a wonderful job bringing power back to the affected communities. Our employees showed the kind of dedication that came through a restructuring and a commitment to quality management. We could never have done what we did in that storm, had it not been for the training and, of course, the dedication of our employees.

Why Does TQM Fail?

TQM fails because it is not implemented in the correct sequence. The first item in that sequence has to be top management commitment. You have to define where the "T" is. Where is the Total in total quality management? That T can be anywhere in an organization. Ideally, it should be at the top, such as the chair or president. It can go down to perhaps a

division or department of a company or institution. If the person leading that division is passionately committed to doing TQM in that organization, then it stands a chance of working. But if the person is not passionately committed—wherever you define Total in your organization—then I can guarantee you that it will fail.

The next step is to articulate the vision, then define the voice of the customer and the voice of business, which ought to define your priority activities for that total quality organization. And then train, train again, train some more, train. Once you have demonstrated the top management commitment to your quality program, the key is to train the totality of the organization so that the entire organization can commit to gaining the continuous improvement that comes from total quality management.

Once training is company-wide, then you are set to do what the Japanese call catchball; that is, to communicate the goals and targets throughout the organization, and then have the organization come back and use the tools and techniques that they have learned, responding to those goals and targets that have been set. That continues through several iterations so that finally, you are able to write an annual business plan that reflects the resources required to address those significant few targets that you set for yourself.

Finally, do not manage to the plan, but *lead* to the plan. Provide the leadership that is necessary to execute the kind of a business plan that is reflected in this top-to-bottom, bottom-back-to-top catchball operation.

Conclusion

Florida Power and Light is beyond the intensive part of the training and applying these TQM principles and is now in the mature phase. Is FPL a TQM company? Absolutely—one that is in the graduate phase and making good use of the investment that we made over a ten-year period leading to this point.

One of the indicators that we are focusing on is the price of electricity. In the brave new competitive world, price is going to be a significant driver of customer satisfaction, particularly among our larger customers. Our goal now, as one of the highest cost producers in the southeast, is to drive this number down. If we can do that, then I think we fit a quote that is attributed to the godfather of all of this, Dr. W. Edwards Deming.

Deming says that as quality increases, productivity increases. This fact is well known, but only to a select few. We at Florida Power and Light Company feel that we are among that select few. My wish for you, as you go forward in your work as higher education facilities officers, is that you join the ranks of the select few. Recognize that you can increase productivity and you can increase quality and bring the price down. They can be done at the same time. Good luck to you in that effort. ■



Components of QIP

© 1993 Qualtec Quality Services, Inc.

Facilities Networking Through the Internet

by Jayne Levin

Illustration by Ted Benson



When flood waters ravaged the campus of Iowa State University this past summer, Lynn R. Seiler, associate director of planning, sent out a "cry for help."

But instead of picking up the telephone, Seiler typed an electronic message on his computer keyboard and broadcast it over the Internet, the world's largest computer network.

Within hours, Seiler received about a half dozen responses from other facilities managers around the country. They offered advice in cleaning up the mess and dealing with FEMA (Federal Emergency Management Agency) and contractors.

Seiler is among hundreds of facilities managers at colleges and universities who have discovered the Internet as a means to communicate efficiently and tackle problems that would have taken days, sometimes weeks, to solve.

About 75 percent of APPA's 1,500 member institutions, from custodians to supervisors to vice presidents, are connected to the Internet. Others, such as Berea College in Kentucky, are developing Internet links.

Via the Internet, facilities managers can share problems and concerns over, say, pest control and bloodborne pathogens, keep up with federal environmental, safety, and health regu-

lations, edit reports, discuss planning and maintenance issues, retrieve information or software from specialty data bases, or just follow the weather, as Seiler did when Iowa was overcome with rain.

Said E. Diane Kerby, APPA's new president and director of facilities management at Berea College: "I think the Internet will give a lot of people, particularly the members of APPA, greater access to information, not just from the APPA office but from other members around the country and the world. We need to be familiar with that kind of technology."

Kerby said she plans to use the Internet to stay on top of federal legislation affecting APPA members and communicate with the APPA office in Alexandria, Virginia.

The University of Kansas used the Internet to structure a training program for custodians to comply with federal regu-

Jayne Levin is a freelance writer based in Cabin John, Maryland. She is also editor of The Internet Letter. She can be reached at netweek@access.digex.net or 800-Net-Week (800-638-9335).



lations regarding bloodborne pathogens.

And APPA itself sends out its government relations newsletter, *APPA Government Relations Update*, to about 600 members on the Internet.

Connecting the World Through the Internet

The Internet was launched by the U.S. Department of Defense as a testbed for computer and military research in 1969 and has since been nurtured by universities, businesses, and governments. It is a vast grid of about 11,000 networks that links users in more than fifty-six countries.

Think of these networks as dots in a coloring book. Connecting the dots makes up the grid and lets information

flow from one network to another. Two years ago, there were fewer than 3,000 computer networks. Advances in computer power and digital data transmission have caused the spectacular growth of the Internet.

By far, the largest use of the Internet by facilities managers is electronic mail, or e-mail as it is widely known.

"I could not function very well in my job right now without e-mail," said C. Ronald Hicks, coordinator of facilities management for the University of California System and chair of APPA's Government Relations Task Force.

Besides communicating one-on-one, the same e-mail message also can be sent to a large group using a discussion list. It costs nothing to subscribe to one. There are hundreds of lists on a wide range of topics, from gardening to business oppor-

tunities in Eastern Europe. Several lists have been set up specifically for facilities managers. They include ERAPPA (Eastern Region APPA), Janitors, and FACSER (for FACilities and SERvices). (See sidebar next page.)

Seiler used the ERAPPA list when he wanted firsthand information about how other universities dealt with natural disasters and FEMA. In the past, communication was done mostly by telephone, or problems went unresolved.

"General cleanup was our first big concern," Seiler said. In July, the university's 15,000-seat Hilton Coliseum was submerged in fourteen feet of water at the height of the flood. The swirling waters tossed around the floor of the basketball court, which had been packed away, knocking out lights, sprinklers, and mechanical ducts. "It just trashed everything," he said.

In other buildings, high waters toppled over file cabinets and contaminated carpets and fabrics with oil and gasoline. Anything mechanical or electrical was shot.

From the ERAPPA responses, Seiler learned the proper way to disinfect carpet and that he should carefully document cleanup costs so they could withstand challenge by FEMA. "We were more conscious of documenting expenses because of their warning," he said.

Having an Internet connection helped Phillip L. Endacott, associate director of housekeeping at the University of Kansas, provide a quick response to a different emergency.

A custodian at another campus had spilled fluids from a laser printer toner cartridge on his body, and a question about whether the substance was toxic was posted on the Janitors discussion list, which Endacott hosts.

"The question was, 'Is this toxic or dangerous? What precautions should we take?'" Endacott said.

Since time was critical, Endacott turned to the Internet. He sent out a message on the Safety List. Four safety officers responded within two hours. "They gave me the complete chemical breakdown of the laser toner," Endacott said. "We knew very quickly that we didn't have a serious problem. The Internet makes me more effective."

Another benefit to discussion lists is that a chronological history of messages posted on a list can be archived, and keyword searches can be performed to locate information in the archive. That feature is handy, for example, when searching for information on dry vacuums or the latest auto scrubbers for cleaning smoke stacks.

Recently, subscribers to the Safety List exchanged information on the testing and design of fume hoods to control acid vapors in research and undergraduate teaching labs. They also have discussed methods to improve air quality in buildings suffering from "sick building syndrome."

"Networking allows you to gather information rapidly and gain some confidence to make a decision on what you want to do in your own institution," Endacott said.

Participating in a discussion list "is like sitting in the same room brainstorming about an issue and not worrying whether you're correct or not correct," said Thomas F. Vacha, director of plant operations at the University of Delaware.

Small colleges and universities have equal access to the Internet as large institutions. This power enables smaller institutions to leverage scant resources.

"The power of some of the bulletin boards [connected to

the Internet] has been a great help in getting answers to all of the questions we have," said Fred Klee, director of physical facilities at Ursinus College, in Collegeville, Pennsylvania. "We now are receiving work requests via campus e-mail rather than by telephone."

Klee also said sending e-mail via the Internet to reach other plant directors eliminates telephone tag. "For some reason, when you send an e-mail message, everyone responds within a short time."

One of the major stumbling blocks to widespread use of the Internet by facilities managers is getting connected and navigating the Internet. Ursinus plans to offer a class on some of the resource discovery tools, such as Gopher and Veronica.

APPA started making the government relations newsletter available electronically last April. "Members love it," said Barbara Hirsch, APPA director of government relations.

"They really appreciate receiving regulatory information in a timely manner. Previously, the only means to disseminate government relations information was through APPA Newsletter and Facilities Manager. With the on-line newsletter, members learn of late-breaking news immediately, and they don't miss deadlines. The newsletter is such a popular service that members don't want to give it up."

Using the Internet to transmit APPA's government relations newsletter alerts facilities managers to changes or new interpretations to existing federal rules on energy, hazardous waste, or building construction.

"If we're remodeling or building a facility and see a regulatory change coming, we might as well build the building that way than according to the rules as they exist today. That saves us the expense of changing it later," said Gary L. Reynolds, director of facilities management at Iowa State University.

Many facilities managers also say the Internet is an efficient way to connect people in different locations. Vacha said the Internet made it easier for him to edit a Facilities Management Evaluation Report he was writing for APPA with two other team members at different universities. Hicks said he found the Internet indispensable as means to coordinate meetings among people from several different offices with conflicting schedules.

Some facilities managers take advantage of the Internet's other functions, such as Gopher, a menu-based system for retrieving information, or the FTP (file transfer protocol) command. Using FTP allows managers to retrieve files from remote data bases such as software to improve e-mail systems on campus. Other data and information available through anonymous FTP include specification sheets on computer hardware and books, such as *Moby Dick* and *The Internet Companion*, an excellent book designed to guide Internet novices. Another good publication is Ed Krol's *The Whole Internet User's Guide & Catalog*.

Still others subscribe to "newsgroups" on USENET News. In its simplest form, USENET News is a collection of more than 3,500 bulletin boards that serve the same function as a discussion list. But it's up to a university to subscribe to a USENET news feed. For those that do, one newsgroup that is watched closely by facilities managers is the Americans with Disabilities Act (bit.listserv.ada-law).

A news service tailored toward planning in higher education is *SCUP E-Mail News*. The electronic newsletter is pub-

lished about every two weeks by the Society for College and University Planning. To subscribe, send your name, institution, address, and e-mail address to Joanne Cate at budlao@uccvma.bitnet or budlao@uccvma.ucop.edu, or call Cate at 510-987-0963.

Gopher is not widely used among facilities managers but is gaining in popularity. The Gopher at Iowa State University, for instance, helped Seiler pinpoint areas of heavy rainfall and impassable roads during the flood. A search of Gopherspace using an Internet search engine called Veronica, turned up another discussion list on total quality management.

Despite the Internet's power to deliver and find information in split seconds, Dave Jackson, general manager of building services at the University of Iowa, said the Internet is underutilized.

"When I say underutilized," said Jackson, "I mean that most people comfortable with communicating by telephone just have no clue of the Internet's capability to not only solve problems, but to share and explore ideas."

In addition to the on-line government relations newsletter, APPA plans to make more information available through the Internet. Listings of upcoming educational programs, Experience Exchange and Comparative Costs data, bibliographic searches through APPA's printed material, and on-line job listings are just a few ways in which the association will use the Internet to provide greater information services to its members. ■

The Top Five Discussion Lists

Here are the top five discussion lists specifically created to help facilities managers.

To subscribe to a discussion list, send an e-mail message to the list of your choice, and leave the subject area blank. In the body of the message, type SUBSCRIBE [list name] [your first name] [your last name].

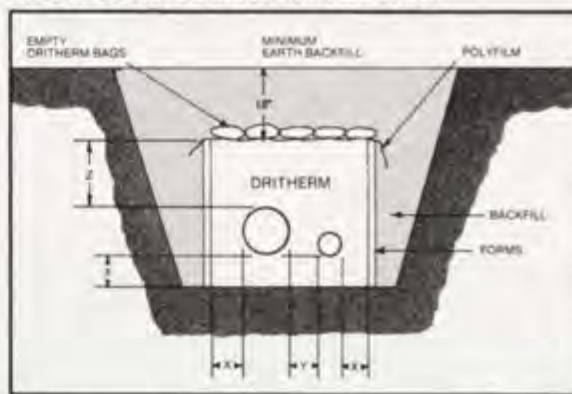
For example, if you wanted to subscribe to ERAPPA, you would send e-mail to LISTSERV@PSUVM.PSU.EDU, and the first line of the text area would read SUBSCRIBE ERAPPA-L John Smith Davis State University. But of course, use your own name and organization.

The server then reads your return address and sends you a note that says you have been accepted. You then should receive whatever traffic comes over the list.

Discussion List	Internet Address
ERAPPA-L	LISTSERV@PSUVM.PSU.EDU
FACSER-L	LISTSERV%WVNVM.BITNET@MITV-MA.MIT.ED
JANITORS	LISTSERV@UKANVM.CC.UKANS.EDU
SAFETY	LISTSERV@UVMVM.UVM.EDU
TQM-L	LISTSERV@UKANVM.CC.UKANS.EDU

Dri Therm, Inc.® UNDERGROUND PIPE INSULATION / CORROSION PROTECTION

- FINE, WHITE MINERAL POWDER TREATED BY A UNIQUE PROCESS TO REPEL WATER/MOISTURE
- IDEAL FOR NEW CONSTRUCTION AS WELL AS REPAIRS TO EXISTING STEAM / CONDENSATE / HOT WATER / CHILL WATER PIPING SYSTEMS.
- HIGH THERMAL EFFICIENCY - 75 - 90% BTU RETENTION
- COMPLETELY HYDROPHOBIC-NO CATHODIC PROTECTION REQUIRED
- NO COMPACTING NECESSARY - POUR DIRECTLY FROM BAG & BACKFILL
- NON TOXIC • USER FRIENDLY • ENVIRONMENTALLY SAFE.



- AVAILABLE IN 50 LB. BAGS & (1) TON SUPER SACKS
- SAME DAY SHIPPING FROM (2) MANUFACTURING PLANTS
- COMPETITIVELY PRICED PER CUBIC FOOT

FREE ENGINEERING MANUAL & COMPUTERIZED THERMAL ANALYSIS AVAILABLE UPON REQUEST.

Call for nearest Distributor / Sales Representative.

DRITHERM, INC. - P.O. Box 5296 - Parsippany, NJ 07054
(800) 343-4188 • (201) 428-0478 • Fax: (201) 428-3391

A "DRI-THERMAL" PRODUCT

Planning *for* Master Planning: *Setting Realistic Expectations*

by John R. Reeve, AIA and Marion B. Smith, AIA

COLLEGES AND UNIVERSITIES can no longer afford simply to react to changes in society—institutions that will thrive and prosper in the twenty-first century are those able to anticipate change, redefine themselves, and align their facilities to support their strategic plan. And all this must be accomplished in a logical sequence and within a practical time frame. For that, a good master plan is essential.

But what exactly is master planning, and how does a college initiate a process that will ensure its effectiveness? Master plans come in a variety of forms. They can deal with a broad overview of the campus, focusing on site development or site acquisition issues. Or they can look at specific factors in

detail, such as compliance with the Americans with Disabilities Act, or where to plant a tree.

Regardless of the particular focus, all master plans have certain fundamental characteristics that shape the dynamics of the process. This article will help you take some of the uncertainty and risk out of the process, providing guidance for how to get a master plan underway to assure its success.

Survey

Early in 1993, we conducted a survey of a representative sample of APPA members about planning for master planning. It was used to gather issues and organize information on what needs to be considered and the activities that need to take place in order to launch an effective master planning process. The responses to that survey (a 50 percent return rate) are included in this article.

The survey posed the following questions:

John Reeve is partner in charge of planning and design, and Marion Smith is partner specializing in design for higher education, for The Christner Partnership, Inc., St. Louis, Missouri. The authors wish to acknowledge the assistance of Jim Roberts of Georgetown College.

1. For your institution, what issues should be addressed by a successful master plan?

You need to bear in mind that while the facility managers polled perceived the need to identify long-range options as the most important issue, different constituent groups take a different view on what is important. For instance, if college development directors were asked the same question, they might well emphasize that fund-raising strategies are the most important—the factor ranked lowest by the APPA membership. A critical lesson is to accept that these different perspectives exist and factor that knowledge into your approach.

2. What reasons could motivate your institution to begin a master planning process?

A planning process is driven by changing strategic goals, which, more often than not, derive from changes in the institution's competitive environment. This is especially true in the case of a college that has not previously conducted such a process and is not in the habit of revisiting its strategic assumptions. The development concepts and priorities may linger from past administrators. New leadership must, as a first step, test those assumptions and validate or change the de facto plan. Of course, a broad range of other external factors such as changing demographics and enrollments, competition, and general economic conditions may also have an impact.

3. Who internally should represent your institution on a planning committee for the master planning process?

Ninety percent of our APPA sample saw facility managers as needing to be involved. The key, however, is that all the campus interest groups (administration, staff, students) must be represented. While students were regarded as less important for participation on the planning team, more than 40 percent of respondents did say that getting student input was important for success.

4. In your view, what obstacles do you think exist in starting a master planning process?

Economic constraints, limited understanding of the benefits, and limited definition of goals, time, and cost top the list of obstacles. But the root source behind these obstacles is the limited understanding of what master planning is within the administration. This translates into a lack of commitment in terms of time, money, and leadership.

5. How would a successful master plan for your institution be used?

Primarily, a master plan is perceived as equally useful as a guide for future development and for scheduling capital budget projections. Less clearly understood is its value as a vehicle for management decision making. It is noteworthy that

FIGURE 1

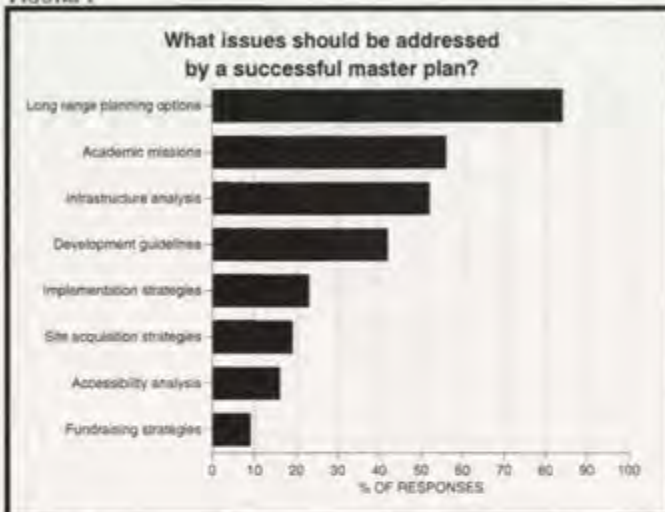


FIGURE 2



FIGURE 3

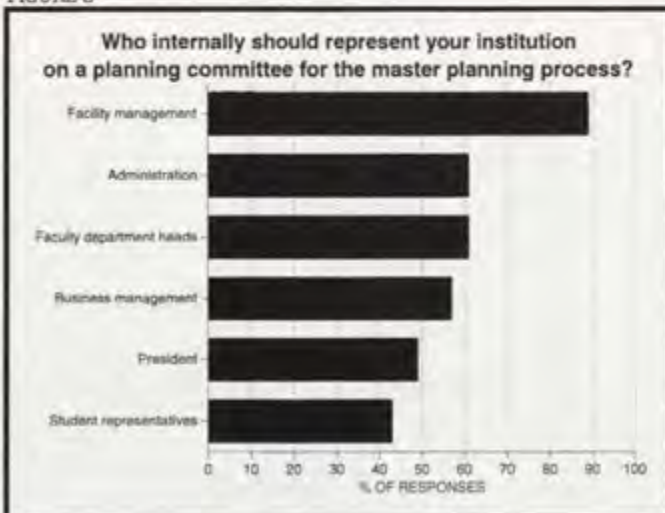


FIGURE 4

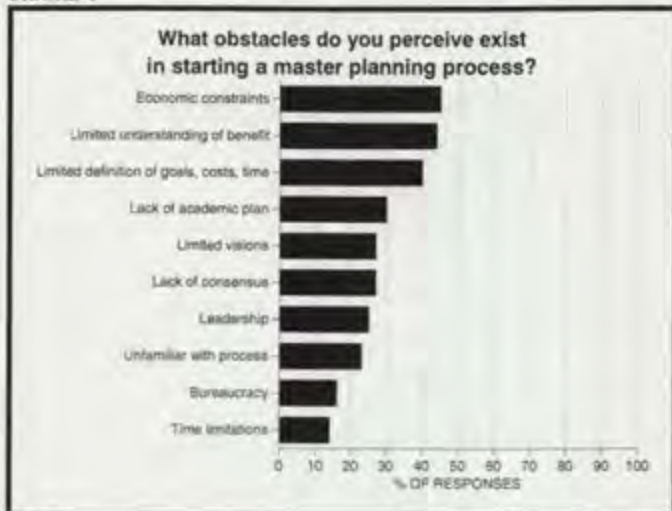


FIGURE 5

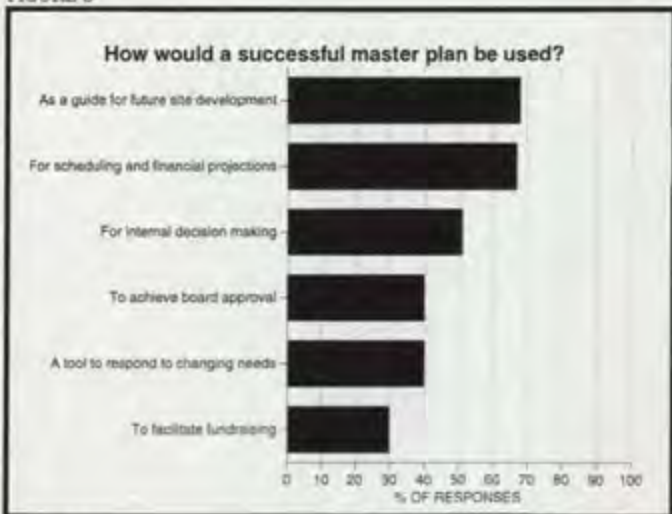
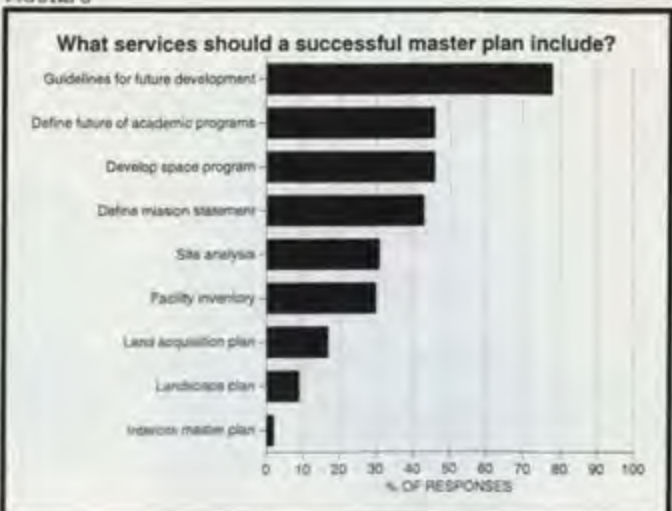


FIGURE 6



some respondents recognized a master plan as a means to an end—achieving board approval for projects.

6. What services should a successful master plan for your institution include?

Overwhelmingly, a master plan is perceived as including guidelines for future development. Clarifying the future of academic programs comes second. Overall, the services that were viewed as critical to the process apply to assembling clear information as a baseline for the future as well as those that define the direction of future actions such as space allocations and land acquisition. With the proper core, the data collection and documentation can set the stage for facilities management.

7. What information would help you to begin a master planning process at your institution?

Respondents indicated that they need to know what scope of task they should undertake in a master plan. For budgeting purposes they need to know what fees to accept. The appropriate fee and personnel time commitments can be clarified at the start, with the schedule conforming to expectations. Early involvement of a master planning consultant can be helpful in defining the tasks, streamlining the process, and anticipating problems.

Respondents made clear that a definition of the scope of the master planning process is the single most important task to be undertaken. And that requires a clear understanding of the basic essentials of a master planning process.

The Basic Concepts of Master Planning

Well-known management guru Peter Drucker made this comment about planning: "Long-range planning does not deal with future decisions, but with the future of present decisions." Put another way, it is what we do today that shapes tomorrow. But how do you rationally anticipate the future of present decisions?

To start with, you must have a vision of where you want to go. To paraphrase the Cheshire Cat in *Alice in Wonderland*, "When you don't know where you're going, any road will get you there." An effective master planning process, on the other hand, involves making decisions about how you can get to where you want to go.

If a master plan responds only to the existing site and its buildings, it is reacting to the status quo rather than anticipating what the college wants to be and how it must change to get there. Rather, the master plan must anticipate the future by considering facility needs generated by the college's mission statement, strategic plan, and corresponding academic program. The strategic plan is the critical step in establishing the framework for the master plan; if it is not in place already it should be the first step in the master planning process.

Although it is common to think about the master plan in terms of a distinct product, such a view is misleading. The

diagram in Figure 8 is a view of master planning in more specific terms of both the process and the product. The process is as important as the product—with a flawed process the resulting product may languish on the shelf.

In this conceptual model for master planning, the nine boxes represent the master planning process, the box on the right the product. The master planning process begins with the mission statement (represented by the circle in the diagram).

In the first column, strategic, functional, and physical information is gathered independently, then organized and analyzed. In the second column, the synthesis begins as the academic program, for example, guides the facility space program. In the third column, potential solutions are developed, evaluated, and refined in an iterative process. For example, options are tested against financial implications and the overall development picture.

Finally, the preferred option is developed into a final coordinated plan. Such a plan integrates how the buildings are to

FIGURE 7



FIGURE 8

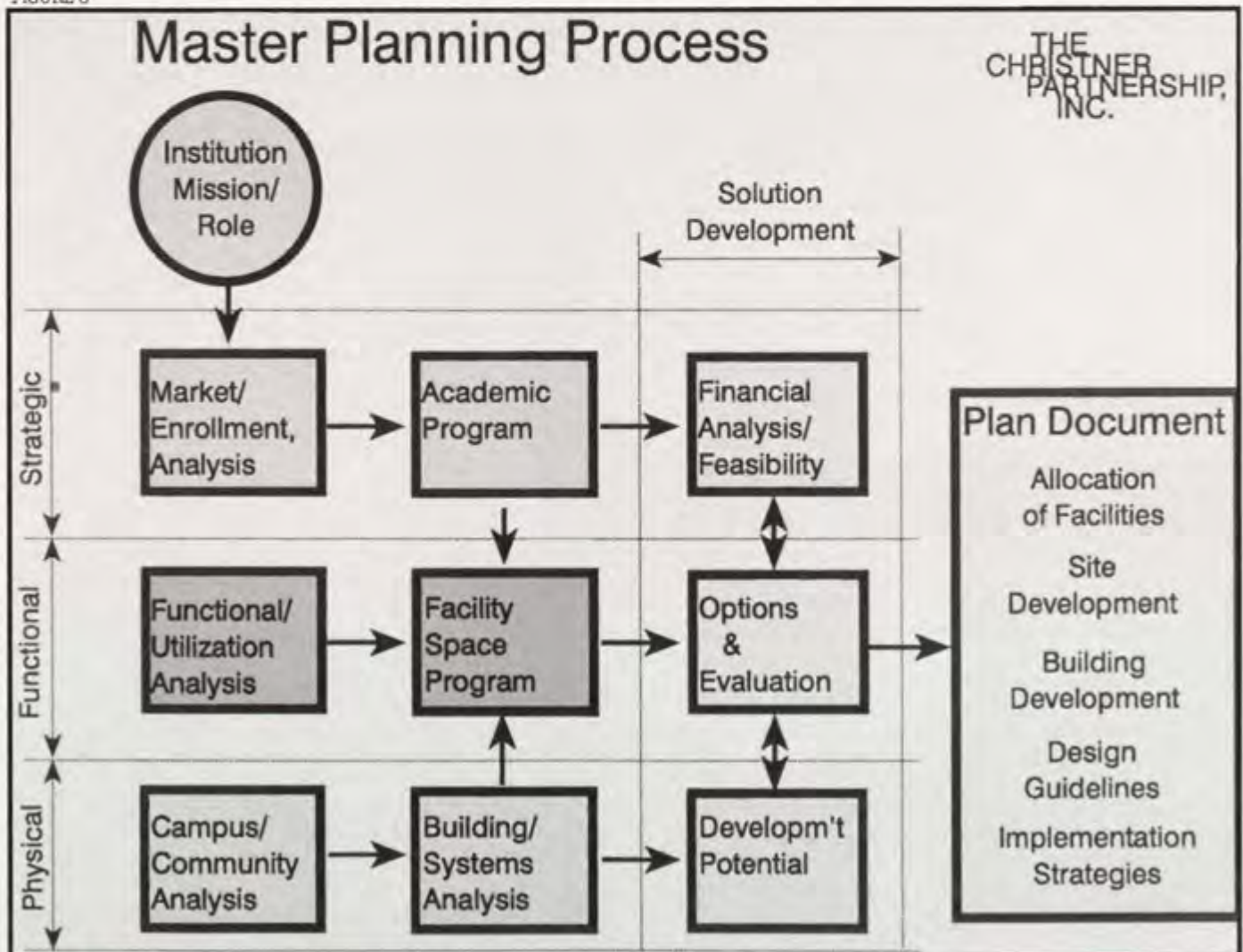


FIGURE 9



be used, how the site should be developed, design guidelines for future development, timing, and cost implications. Since the institution's environment is far from static, a good plan may well incorporate options allowing flexible responses to different scenarios.

The questions used in the survey were reworded into the following issues, which are presented with commentary and elaboration.

What Does the Master Plan Need to Accomplish?

The key to a successful planning process is to set realistic expectations and provide adequate resources. The first step is to identify the driving needs for the master plan in order to define the goals of the process—what this effort needs to accomplish.

Reasons for embarking on a campus master plan are usually broad, covering guidelines for future development, changes in the market, and competition for funding. Starting a master plan is usually triggered by the need for specific answers to specific questions, such as, "Where are we going to put the library?" Or, "What potential does this parcel of land have for our future?" Whatever the immediate reason, a sound master planning process can turn that need into an opportunity. This cannot be over-stressed. For example, it may be possible to incorporate the implementation of a new chiller loop into upcoming building projects.

Once these motivations for planning are recognized, specific outcomes for the planning process can be defined, and the process tasks and necessary services will be evident.

What Professional Services Are Required?

Needs and issues to be addressed lead to a definition of services (tasks) to satisfy them. Some pieces may already be in place, such as a mission statement. The remaining tasks will constitute the master planning process and may include aspects of the following:

- Strategic review
- Functional analysis
- Physical analysis
- Solution development
- Plan document

Figure 9 presents master planning activities, with what we view as the critical core activities shown checked off. These checked activities, taken as a whole, make the master planning process more than just a study of various characteristics of a campus. Instead it becomes a comprehensive decision-making system.

What End Product Would Be Most Valuable?

In addition to defining services, it is important to understand how you will use the master plan and the form the product should take. This product can vary enormously depending on how you intend to use the plan, from written narratives to models, even videos, with a corresponding range of cost. Wherever possible, information should be presented graphically as well as in text. A picture is worth a thousand words. While text and figures may be precise and comprehensive, graphic images more powerfully communicate the current situations and the outcomes of implementing recommendations. This is a great boon, as most people have difficulty translating text into its three-dimensional implications.

Perhaps the most useful is a document that summarizes the process, presents data and analysis, and makes recommendations regarding future decisions. Cost and phasing information is fundamental, especially regarding projects that need to be executed before other projects can proceed.

If the master plan is to be used for making decisions internally, for scheduling and financial projections for future capital projects, the documentation can be relatively lean, with simple (and less expensive) covers and graphics. If the master plan is to be used for communicating the "new campus vision" for approval by the board or other regulating authorities, or for fund raising, a more elaborate documentation that sells and builds wide consensus may be appropriate. The level of detail required relates to the audience, both to its base of knowledge and to its possible response to and endorsement of the recommendations and other information.

A tailored combination may serve you well with an executive summary as the "selling" document, while the detailed record of the process might be less elaborate in its presentation. In any case, a detailed record of the logic of the master plan is useful since it allows the college to revisit decisions as economic, demographic, political, and personnel changes occur.

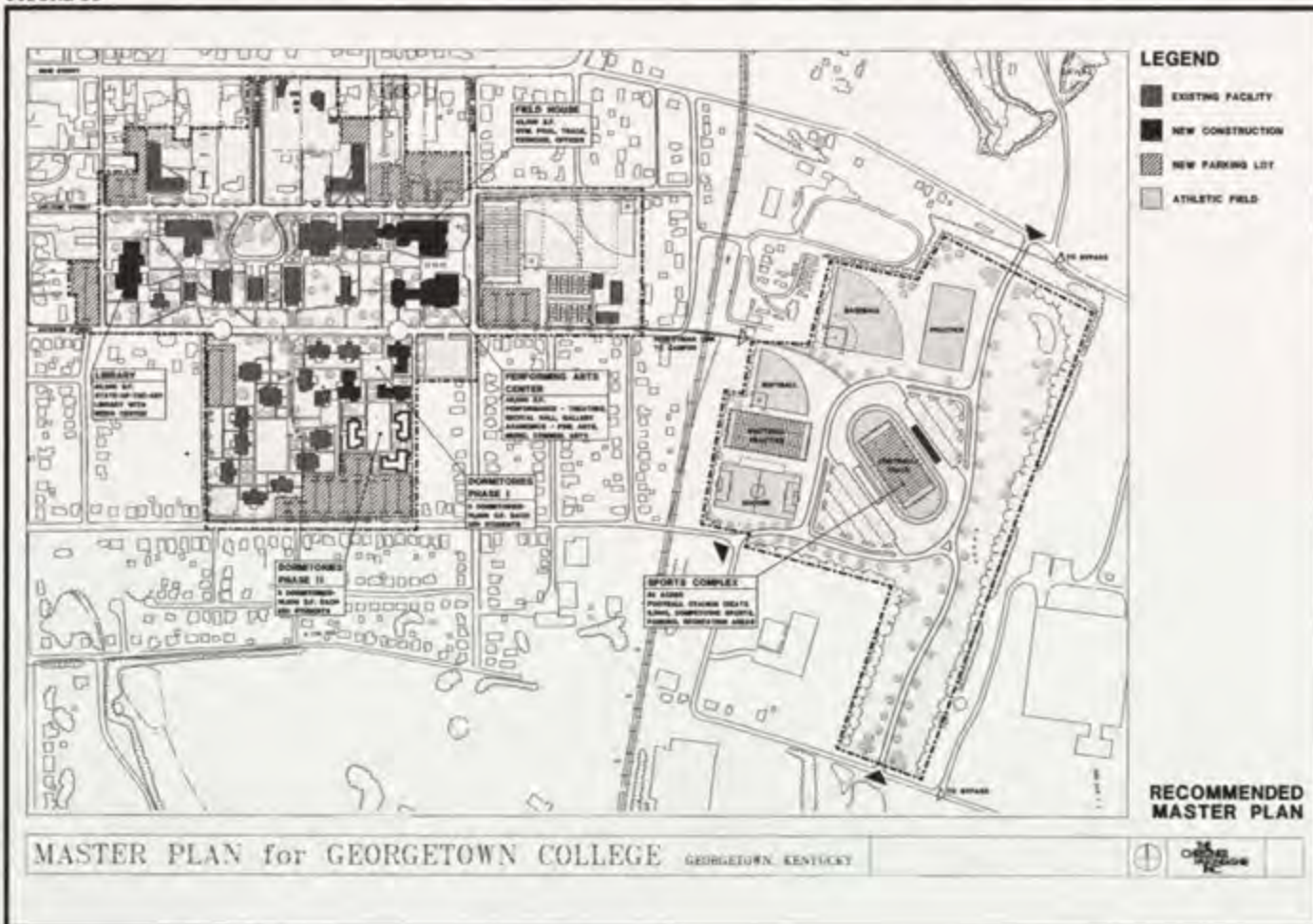
Who Should Be Involved?

Once services and tasks are identified, it is possible to identify who should be involved in the process. Faculty members will be most concerned with academic and space programming. All physical development issues will be of great interest to facility managers. Strategies that will affect campus image or will require funding will be of great concern to administrators. From the president on down, the overall success of the planning process is dependent on incorporating the interests of many different constituencies.

The planning committee itself should not exceed fifteen people. It is critical to involve representatives of different decision making levels, including a member of your governing body, to ensure their support. And don't forget those important clients: alumni, the students, and perhaps even their parents, who are paying tuition. In some cases you may wish to involve the community and key local businesses in some manner during the process. This can be especially valuable if a town-gown tension is prevalent. In lieu of including representatives from all these categories on the planning committee, consider setting up task forces around particular issues.

Involving these groups will ensure that all interests are represented and that the plan is balanced and supported by all groups. Also, including some doers as well as thinkers in the process will give the plan a much better chance of being implemented. Planning can be lengthy, and those involved need to commit their time, with meetings scheduled ahead so that participants can be assured of attending. Missed meetings create an unfortunate dynamic that compromises the balance and continuity of the outcomes of discussion.

FIGURE 10



What Useful Information Is Already Available?

Often a considerable amount of information is already available. Existing records can facilitate inventories of current space allocations and actual space uses. Increasingly, campus sites and buildings are already documented on CADD, saving both time and money in the master planning process. If a particular building has been the subject of a study in the past, that information can also provide directions for assessments of other buildings, as well as information about building and site systems.

Available information can reduce the time needed to analyze present facilities, thus reducing the total time of the planning process.

How Much Time Will It Take?

When a master plan process is finally authorized, someone

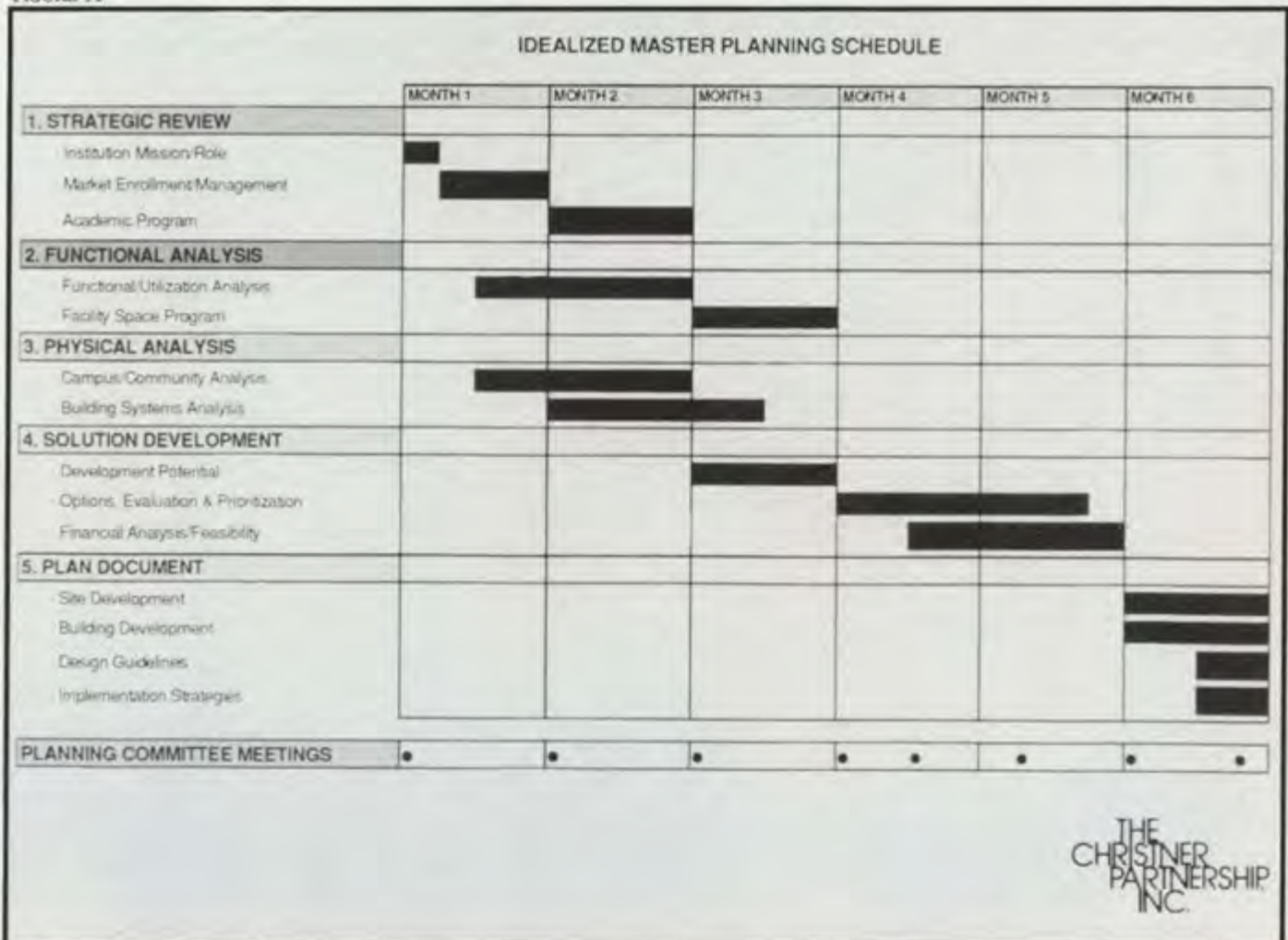
is usually in a hurry. Funds have been raised for a new building and everyone is eager to get going. Or maybe the plan is mandated by state government and it has to be filed by a particular date.

The scope of the plan, the size of the institution, and the numbers of people involved are all factors affecting the process duration, but it is possible to push the process too fast or let it drag on too long. Either will risk the success of the plan.

Remember that your master plan may very well be setting the direction for the next ten to fifteen years. The consequences of these decisions are significant and you ought to invest adequate time to think through the repercussions of various scenarios. On the other hand, too slow a process will make it difficult to keep the participants focused and to sustain creative involvement.

A realistic amount of time for a thorough master planning process can range from six to nine months. Since some information can be developed concurrently, tasks can be overlapped to a degree.

FIGURE 11



Even with an outside consultant, you will need to commit the time for some of your staff to coordinate the effort. Task forces and planning committee members must make a commitment to attend review meetings throughout the process. Even with other obligations, the campus staff commitment may be substantial, perhaps as much as a third of their time.

How Are Qualified Consultants Selected?

The decision of who to hire to assist you in your master planning process is critical because you will look to this party to lead the process, provide insights from other institutions, and provide a significant measure of creativity. To make an informed decision, the first question you should ask is: What factors are important to you for your situation?

Experience in master planning and knowledge of educational issues are fundamental; you should look for a consultant who is an acknowledged expert at master planning. And while architectural design knowledge for educational facilities is an asset, it is wise to make the distinction between designing a building and campus planning. Also, the total team warrants scrutiny, including associated consultants such as engineers or academic planners. It will be individual peo-

ple who will do the project—so look beyond firm credentials.

Just as important is the chemistry between your institution's in-house planning team and the consultant's personnel. Spend time getting to know the consultants. You will develop a feel for their communication style and an indication for how you will get along for the duration of the planning process.

But where can you get the information you need to shed light on these factors? Interestingly, the standard sources of information—formal interviews, submittals of qualifications, and scope/fee proposals—don't always shed light on some of the most important factors. Visit the offices of candidate firms, and have them come to your campus and meet with key people in informal workshop settings.

How Much Will It Cost?

The amount of money you need to budget for an outside consultant will depend not only on the services and products that you have defined, but also on the data you are able to provide the consultants in order to get started. If you have good existing documents of your campus and the buildings and how they are used, much of the information-gathering time required by the consultants will be reduced. Also, if you



TMA™ - Computer Aided Facility Maintenance Software for Universities

MS Windows™ & Macintosh®

Physical Plants Have Unique Needs



TMA benefits:

- Track and Control Costs
- Improve your PM Program
- Control Inventory
- Track Equipment & Building Histories
- Use Manpower and Assets Efficiently
- Comply with Safety Codes & Regulations

A campus is not a factory, so why buy a CMMS designed for factories? TMA is designed for the unique needs of a physical plant. TMA gives you the features you need, from tracking work by building and room to chargeback of costs to departments or accounts. Unlike the other guys, TMA is driven by the college market, which is why 85% of our clients are schools.

#1 in The College and University Market

TMA has become the system of choice in schools from coast to coast which has made it the best selling facility maintenance management system in the market. If you haven't seen TMA you haven't seen *The* facility maintenance software for colleges and universities. Call now for a free demo disk and see for yourself why TMA is getting rave reviews.

TMA features:

- Intuitive Design
- Space-based
- Over 90 Pre-formatted Reports
- Work Orders & PM
- Inventory Control
- Equipment Histories
- Ad Hoc Reports
- Bar Coding
- Hazardous Material Tracking

See For Yourself - Ask For A Free Demo Disk

TMA Systems Inc.

5232 E. 69th Place • Tulsa, Oklahoma • 74136

**Call
(918) 494-2890**

FIGURE 12



have the site and buildings already on CADD, it will further reduce the time your consultant needs to establish the base drawings for the plan.

A well-spent penny of planning can save dollars when it comes to implementation. This truism can prove itself in several ways:

Guided by a master planning process, your resources will be applied to achieve your most important goals—your physical assets will support your strategic goals.

You will get it right the first time, winning plaudits and gratitude, especially when facilities are ready for the commencement of classes after a break.

You can actually create economies with good planning, such as avoiding some expenses and fulfilling others by avoiding overlapping or repetition.

Keep in mind that you are not buying a commodity or product. You are paying for the time of professionals (and the per-hour cost of professional time doesn't vary much), so the key to getting value is to make sure the time is focused on the issues that are most important to your situation.

A range of \$50,000 to several hundred thousand dollars can be expected. The cost of the master plan should be regarded as an investment instead of an expense. At the very least it will save money and it can be used to leverage funding or donations to the college.

Given budgetary constraints, you may wish to spread the master planning process over several years to reduce the impact to your budget. The mission statement and strategic planning might be scheduled for one year, the academic and space programming for another, and the development strategies for a third. Subsequent years might include more detailed studies that fit into the plan, such as a campus utility plan or ADA compliance.

Your development office should follow in the wake of the planning effort to key in on fund-raising opportunities. Involving local businesses in the process may give you the opportunity to meet some of their needs in combination with your own to generate income in the future. At the very least,

you can keep them interested and involved with your institution.

How Can Planning Be Promoted?

Though you may already be sold on the value of master planning, others in your organization may need to be convinced—if the president isn't on board, nothing much will happen. By reviewing some of the benefits with your president, you may be able to trigger interest so that he or she may talk to counterparts who have already gone through the master planning process. Internally, you may need to point out the benefits to be gained to sell the concept.

The president may respond to the opportunity to bring a visual image to his or her vision for the college.

The business officer may appreciate the potential for logical capital budget planning and apply resources in a balanced, cost-effective manner.

The development director or president will appreciate having a clear explanation for how donations to the institution will be applied.

Additional reasons for undertaking a master planning process include

- Ensuring that your facilities support your strategic goals.

- Creating a shared vision within your institution.

- Making better use of your existing site and facility needs.

- Anticipating your future site and facility needs.

- Avoiding waste and disruption resulting from piecemeal projects.

- Establishing a realistic schedule and capital budget.

- Unifying the aesthetic assets of your campus.

- Enhancing credibility with lending institutions.

- Developing campus maps and building plans for facility management.

- Focusing and energizing your fund-raising and development efforts.

In large part, the challenge is to communicate the benefits and build a broad base of support. It is possible for everyone to feel they will get something useful out of the process.

Conclusion

This era of redefining college mission, and restructuring the institution, is characterized by increasing competition for resources amid the clamor of demands on facilities. In this environment, master planning is increasingly recognized as an indispensable tool for management. In addition, a master plan can be a valuable ally to help facilities officers face problems and issues in an increasingly complex world. ■

For those interested in getting into this topic in greater depth, APPA and the Society for College and University Planning (SCUP) will be jointly sponsoring a day-and-a-half seminar on master planning in March 1994, in St. Louis, Missouri. There will be more information forthcoming.

**APPA Information
Services Presents**

THE INTERNATIONAL EXPERIENCE EXCHANGE

**A Data Base
For Higher
Education
Facilities
Management**



**The Association of Higher Education
Facilities Officers
1446 Duke Street
Alexandria, Virginia 22314-3492**

**APPA Information Services
Telephone: 703/684-4338
Fax: 703/549-2772**

For more than five years APPA has provided information and "networking" assistance through our **International Experience Exchange** data base. The data base contains a wide variety of information from more than 1,000 institutions of higher education. The APPA office has responded to thousands of requests for information and materials.

Because of the flexibility of the data base, we are able to provide a printout listing the colleges and universities that have similar concerns or that have previous experience in a project or activity on which you would like more information or assistance. For instance, if you wanted a list of public institutions that used contract custodial services, simply call APPA Information Services. If you need a list of schools with cogeneration plants, or custom-designed preventive maintenance software, or that have built or renovated a library or sports facility, the **International Experience Exchange** is here to assist.

Information can be selected by a number of different criteria, including:

- Carnegie classifications of institutions.
- Size of physical plant or number of full- or part-time employees.
- Type of program or number of FTE students served.
- Physical plant responsibilities.
- Construction and planning responsibilities.
- Classification of buildings.
- Utilities sources.
- Activities in employee training or employee morale/recognition.
- Computerization.

The **International Experience Exchange** is a free service to APPA member institutions. All you need to do is call or write us with your request, and we will respond as quickly and completely as possible. If we cannot answer your question, we will refer you to other resources or organizations. If your institution is not on the data base, please complete a survey form and return it to APPA for inclusion. The more schools we have on the data base, the more comprehensive the data will be.

For more information about the **International Experience Exchange**, or to receive a blank survey, call APPA Information Services at 703/684-4338. With all this information only a telephone call away, we encourage you to use this valuable APPA program.



Bags being emptied onto the sort conveyor.

photos by Jean DePamplis

Miami University

Re

by Stephen K. Gaski

In this era of public awareness about environmental issues, recycling programs are becoming a standard at university campuses throughout the country. However, just as academic courses vary on each campus, every university recycling program works differently. At Miami University, we've adopted an innovative approach to recycling that responds to the needs of each sector of the campus.

The current program has been in full-scale operation since January 1991. Before this time, recycling was primarily handled by Miami-Oxford Recycling Enterprise. However, two events prompted the Miami University Physical Facilities Department (PFD) to initiate a campus-based program. During 1990, Institute of Environmental Science graduate students conducted a solid waste characterization analysis at the university and found that more than 40 percent of the refuse generated on campus was recyclable material. That was also a year when large numbers of students and faculty called on the university to accept a direct responsibility and commitment for the environment by implementing a comprehensive recycling program.

PFD conducted several surveys of buildings with source separation recycling programs. The waste that remained after the source-separated recyclables were removed, was sorted again to determine what recyclables remained. In all instances, we determined that at least a 15 percent increase in material recovery was possible.

After reviewing other options to remove recyclables from the waste stream in the academic/administrative buildings, we decided that a material recovery approach to recycling had the highest recovery potential. There are two types of material recovery. One approach is to collect all of the solid

waste, transport it to a processing center, and send it down a conveyor line where workers remove the recyclable items. The second approach is to send commingled recyclables—or waste that is not heavily contaminated and contains a significant amount of recyclable material—to a processing center where it is sorted as in the first approach.

Miami University Recycles! collects the university's recyclables in two trucks. Every morning, a driver picks up material from all of the thirty-two academic and administrative buildings. Since these buildings generate primarily paper and paper products, we collect all of their refuse (except bathroom and lab waste) in an effort to recover as much recyclable material as possible.

Recycling in the residence halls is handled by source separation. Students place paper, newspaper, beverage cans, plastic, and glass in stacked bins located next to each corridor trash container. Sixteen buildings are serviced three times a week; another eighteen buildings are serviced two times a week.

The program has established several special drop-off locations in convenient areas. Two renovated beverage trailers serve as complete collection points for plastics, beverage cans, glass, and paper. Five one-yard dumpsters are reserved for newspaper and, along high-traffic pedestrian walks, thirty 55-gallon drums have been modified to collect beverage cans. The recycling program at the Oxford campus also serves the Hamilton and Middletown branch campuses. The daily shuttle picks up about two cubic yards of a variety of recyclables (paper, cardboard, cans, bottles, and plastics) from each campus.

The Miami University Approach To Recycling

The design and construction of a material recovery recycling facility was the first step in developing this unique approach to recycling on a university campus. A 24-foot by 48-foot metal building with a 16-foot ceiling was constructed

Steve Gaski is assistant director, buildings and special services, at Miami University, Oxford, Ohio.

cycles!

on university land approximately one mile east of the main campus. Adjacent to the building is a large concrete loading dock that allows us to park semitrailers and roll-off containers for easy loading. The building is heated with a waste-oil-burning furnace that allows us to burn old motor and hydraulic oils, which we formerly paid to have recycled.

Inside the building are conveyor systems that transport the waste as it is sorted. The waste is dumped into a hopper on the loading conveyor that carries the waste up to the main sorting conveyor. This conveyor is approximately 32 feet long and is installed approximately 6 feet above the floor. The elevated conveyor allows carts that collect the recovered material to be placed under the conveyor. Along the main sorting conveyor are a series of sorting stations where personnel are stationed to remove recyclable materials. Materials that are not recycled travel down the line to a chute that carries the material out of the building into a trash compactor. The compactor pushes the material into a 42-cubic yard roll-off container, which is transported to the landfill when full.

Located near the end of the main sorting conveyor is a chute where the office waste paper is removed. The office waste paper travels down this chute to a short conveyor that allows additional sorting of the waste paper to remove the higher quality papers. The office waste paper then travels out of the building into a compactor unit and is transported in the roll-off container to a waste paper broker.

Additional equipment at the recycling center includes a beverage can sorter/crusher that sorts the bimetal cans from the aluminum cans and compacts the aluminum cans prior to their being blown into a semitrailer. We have a baler that is used to bale cardboard and both high density and PET plastics. We also have a high-volume paper shredder that is used on confidential waste paper and newspaper for the animal bedding program. The shredded newspaper is baled with a hay baler that was purchased at a farm auction and rebuilt by

university personnel.

In fact, most of the equipment at the recycling center is used equipment that was modified and reconditioned to meet our needs. The conveyor lines and worker platforms were purchased from a company that liquidates manufacturing facilities. The cardboard baler was obtained as a reconditioned unit, and the can sorter/crusher is a used machine that is on loan to the university. This saved approximately \$28,000 in equipping the facility.

A 12-foot by 48-foot addition was completed in the fall of 1991 to house the can separator, the paper baler, and the three-glass crusher. This puts the crushing operation out of the actual work space. The total cost for the material recovery facility (\$102,909) is almost \$50,000 less than the cost avoidance we've realized in labor and solid waste disposal.

The recycling center is unique for a university program. It functions as a small materials recovery facility (MRF), in which student workers separate commingled recyclables along a conveyor system. Glass is sorted and crushed by color. Cardboard and PET (#1) and HDPE (#2) plastics are compacted with a down-stroke baler. Newspaper is shredded and formed into bales (similar to hay or straw); it is either used by the Miami University stables or sold to local farmers. Our polystyrene operation is also one-of-a-kind. We clean and granulate the plates, cups, and utensils generated by more than 2,000 meals served daily at the food court.

Miami University Recycles! is a division of trucking and special services in the physical facilities department. All operations are overseen by a recycling coordinator. The program employs sixteen Miami and local high school students and a civil service worker as drivers and operators at the MRF and polystyrene machine. This equates to 452 work hours weekly, or the equivalent of 11.3 full-time employees. Community service workers also staff the center to meet their court requirements. Recycling activities run from 6:00 a.m. to 10:00 p.m.

Monday through Friday, and an additional eight to twelve hours on weekends.

Items Recovered from the Solid Waste Stream

Newspaper

Newspaper is recovered on the sorting line or by drop-off locations throughout the campus. Currently, more than 4,000 pounds of newspaper is recycled on a monthly basis. This is a decrease of almost 70 percent from last year due to the city of Oxford's implementation of curbside recycling. About half the paper is sent directly to the university stables, where it is shredded and blown into the stalls with a bedding chopper. This is done by students working for the stable vendor. This operation saves the university approximately \$800 annually. The remaining newspaper is shredded and baled at the recycling center for sale as animal bedding. Approximately ten bales, or 500 pounds, of newspaper are processed on a weekly basis. The animal bedding is sold to local farmers for \$.75 a bale. This gives the newspaper a value of \$30 a ton, which is sufficient to recover the processing costs.

Office Waste Paper

Most of the waste paper recovered is mixed office waste; there is some recovery of computer waste paper, however. Most of the computer paper used on campus contains ground wood, which lowers its value in the recycling market. We are currently working with a wastepaper broker to set up a white-paper recycling program that will enable us to recycle that paper at a higher value than the mixed wastepaper category. Approximately half of the paper from the academic/administrative buildings is recovered on the sorting line. The remainder is recovered by source separation programs that are located in areas where high volumes of waste paper is generated. Confidential waste is shredded by the same machine that is used for newspaper. The shredded confidential waste is recycled as mixed office waste.

Approximately 3,900 pounds of mixed office-waste is recycled from the academic/administrative buildings on a weekly basis. This has been a decrease of almost 2,000 pounds per week compared to last year. Much of this can be attributed to waste avoidance by use of on-line, memo-driven inquiry capabilities for computers, electronic mail, double-sided copy printing, and budget cuts. The blue bar computer paper, which has a high wood fiber content, has been difficult to market. We have made arrangements for it to be hauled away by a local recycling operation at no cost to the university.

Cardboard

The majority of the cardboard to be recycled is collected from special containers at locations on campus where high volumes of waste cardboard are generated. This cardboard is collected at no cost to the university, other than container rental, by the solid waste contractor and transported to their recycling center in Richmond, Indiana. Approximately 50 cubic yards of compacted cardboard is recycled in this manner. This has been a 25 percent increase over last year. At those buildings that do not have collection containers, the cardboard is transported to our recycling center and baled into approximately 700-pound bales. These bales are sold to a waste paper broker for the current market price. At present, three bales of cardboard are generated on a weekly basis.

Glass

The amount of glass we receive has increased this year with the addition of the source separation bins in the residence halls and glass collection containers at Shriver Center. Much of the glass is still recovered from the sorting line. We have markets for clear, brown, and green glass at \$50 per ton. Approximately 2,200 pounds of glass are recovered weekly.

Polystyrene

The majority of the polystyrene waste generated on campus is at the Shriver Center. Approximately forty bags of polystyrene are processed on a daily basis. Approximately one cubic yard of additional polystyrene waste is recovered daily at the recycling center. This waste is sent to the Shriver Center for processing. About 350 pounds of polystyrene flake are produced weekly. This flake is sold to a manufacturing firm that makes products from recycled plastics. The current value of polystyrene flake is \$.05 per pound. We also receive polystyrene from Miami University's Hamilton Campus. There has been nearly a 700 percent increase in the volume of material generated over last year, largely due to the changes in student meal plans.

Beverage Containers

Beverage containers are recovered in several ways. The largest percentage is recovered from the Buy Back Program in the residence halls and the can containers that are placed throughout the campus. Can containers are also placed in the vending areas and some corridors of the academic/administrative buildings. Approximately three-fourths of a cubic yard of cans are also removed from the solid waste on the sorting line daily. Approximately 4,300 pounds of cans, 90 percent aluminum and 10 percent bimetal, are recovered on a monthly basis. Eighty-five percent of the beverage containers are recovered from source separation programs.

Used Motor Oil

The recycling center building is heated with waste motor oil generated by the university garage, and waste hydraulic fluids generated by preventive maintenance servicing of building elevators throughout campus. Approximately 1,600 gallons of waste oil is generated on an annual basis. Prior to this recycling program, the oil was collected by a waste oil recycler at a cost to the university of \$.15 per gallon. In addition to the savings in disposal cost, a cost avoidance of approximately \$750 to purchase heating oil has been realized. The total cost savings will result in a five-year payback on the cost of the heating system.

Plastics (PET and HDPE)

The majority of our plastics are coming from source separation operations at residence halls. Approximately 500 pounds of plastics are being recovered monthly and baled into 375-pound bales. The market price has remained low, and we continue to get \$.01 per pound for plastics.

Yard Wastes

In November 1992, Miami University began a comprehensive composting project. Due to differences in chemistry and seasonal generation, leaves, grass, and brush are composted separately. Leaves are collected during the fall. Manure from the stables is added and the mixture is formed into windrows—long, narrow piles in parallel rows. The windrows are turned once every two to three weeks with a

redesigned rotary scythe to ensure even heating and decomposition. In six to nine months, this fine textured compost can be used as a soil conditioner in plantings throughout the university.

Since brush is initially too large to easily compost, it is shredded with a tub grinder and placed in windrows with grass clippings. As with the leaves, it is turned frequently; in ten to fourteen months, this coarse material makes a good mulch. In all, campus services collected at least 850 cubic yards of yard waste and manure in the first six months. In addition to the cost savings of being able to use the composted material as mulch and soil conditioners, we have also realized a cost avoidance of over \$1,200 for that which we land-filled before.

Other Materials

Other materials that are recycled at Miami include tires, wood pallets, all ferrous and nonferrous metals, food grease, copier and laser printer cartridges, and ash from coal boilers.

Drop-Off Locations

We have two used beverage trailers that have been converted to drop-off containers. The trailers contain eight bins on each side. Holes have been cut in each roll-up door to accept the recyclable material, and rubber flaps have been placed over the holes to seal out moisture. Signs have been placed on each door to indicate what materials should be placed in the bin. When the trailers are full, they are pulled by the university semitrailer to the recycling center for unloading. Materials accepted at the drop-off locations include mixed office waste, newspaper, glass, plastics, polystyrene, and beverage containers. The purpose of the drop-off containers is to accept recyclable material from students and staff living in locations where recycling services are not available. With the implementation of the city of Oxford's current curbside recycling, we have seen a significant decline in material recovered here—about 30 cubic yards per week versus 80 cubic yards when the program started.

Waste Avoidance

This is an area that we continue to make a major goal, since recycling is only one portion of an effective waste reduction program. We continue to promote the use of modified vending machines that allow for no-cup vending, which enables the customers to use their own cups. Another waste avoidance program has been the removal of reusable items from the waste sorting line, such as manila file folders, which are recovered and sent to the office storeroom for reuse. A new program began this year to collect cartridges from dot matrix and laser printers and typewriters. These cartridges are sold to a printer-servicing company in Middletown that refills them for resale as part of their Earth Rescue Program.

Last year, in cooperation with Goodwill Industries, students in residence halls donated 12,000 pounds of usable carpeting, clothing, furniture, and small appliances at the end of the school year, all of which would have been placed in



View of the sorting line.

dumpsters and transported to the landfill at a significant cost.

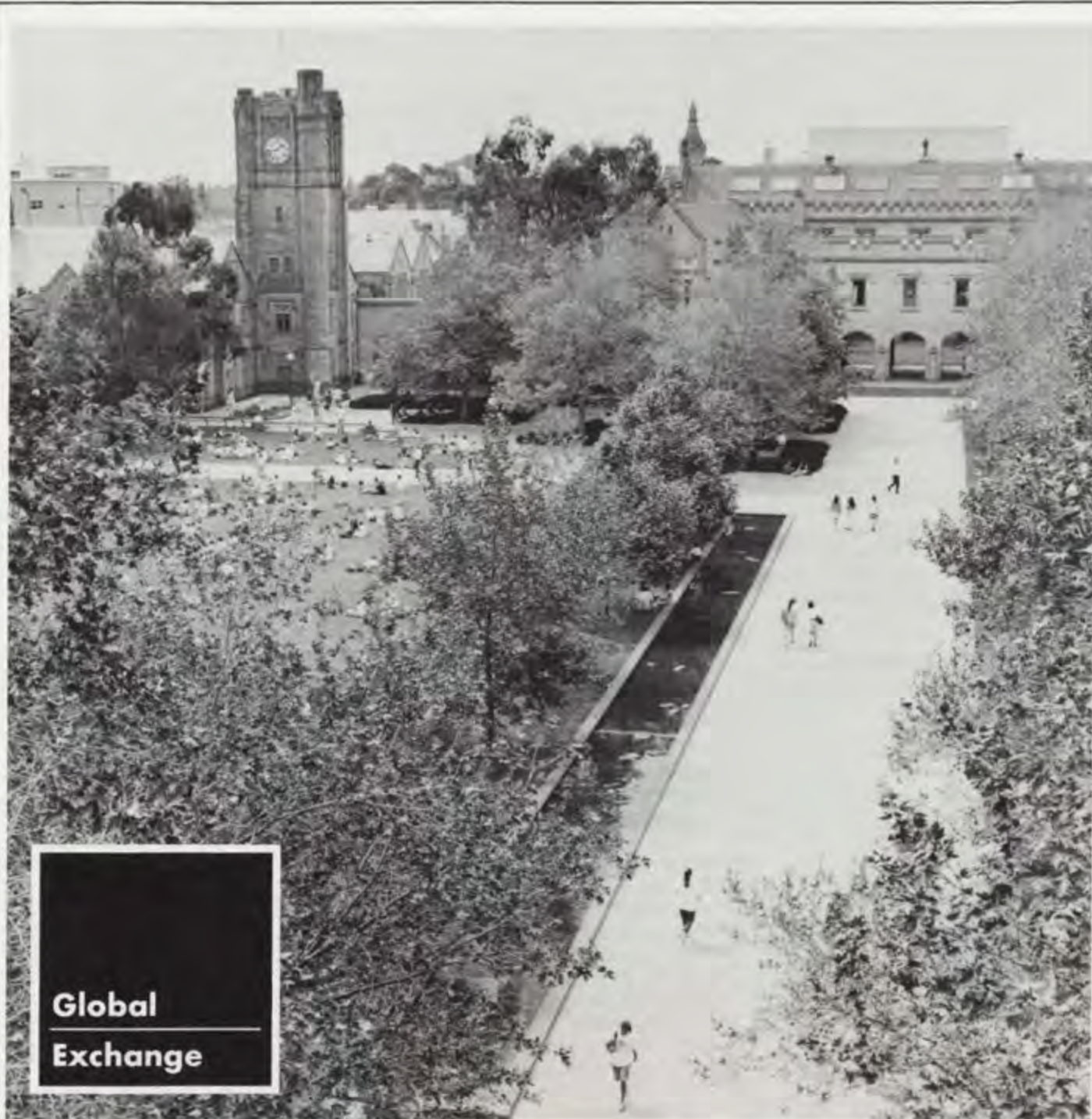
The Miami University surplus auctions held twice each year sell large quantities of furniture, equipment, tools, computers, vehicles, and numerous other items that can be reused instead of being sent to the landfill.

Closing the Loop

Miami University not only has been a leader in recycling, but has actively pursued the purchasing and use of products containing recycled materials. Currently, all toilet tissue and hand towels are 100 percent recycled material. The purchasing office has awarded new contracts to a company that lists fourteen out of sixteen computer stock paper items as recycled products. Recycled plastic lumber products are being used as picnic tables, park benches, bumper blocks, and most recently, as shower seats in residence halls. In Ogden Hall, the new living room carpet is made from 100 percent PET plastic fibers. It is now starting to become more common practice to include specifications for recycled products in purchase requests.

Miami University will strive to remain a leader in recycling. Our recycling program not only serves our immediate needs, it considers our future as we reduce the amount of waste materials sent to shrinking landfill space (thereby reducing costs for waste disposal), saves our diminishing natural resources, and creates an environmental awareness that we hope will become a habit.

Recycling must become a high priority for business and education. Unless we are willing to change our priorities, we cannot hope to leave our children a better world. It must become important to everyone to recycle all possible materials in the workplace and at home. When each individual makes recycling a priority, manufacturers will make it a priority. ■



Global Exchange

The University of Melbourne

Arthur W. Bradley

The University of Melbourne is just north of the city of Melbourne at the southeastern tip of Australia. The university is funded predominantly by federal government (60 percent) with private funding totaling an additional 20 percent. The remaining 20 percent con-

sists of research grants from various government bodies. The university is strongly research oriented and is moving toward a greater proportion of graduate students. At present, we have 25,000 (EFT) students enrolled and offer degrees in arts, law, commerce, agriculture, engineering, medicine, architecture, music, education, and business administration.

Our building stock varies in age, dating from 1854 to 1993. There are seven-

ty-two buildings on our main campus of forty acres. Surrounding the university are houses and other properties that are used for student accommodation, visiting staff residences, and space for academic activities. There are several other properties/facilities scattered throughout the state of Victoria, mostly

Arthur Bradley is registrar of property and buildings at the University of Melbourne, Parkville, Australia.

◀ **SOUTH LAWN** Area above the South Car Park with reflective pool looking across the South Lawn toward the Old Quadrangle and Old Arts clock tower.

UNDERGROUND CAR PARK This car park, completed in 1972, is of considerable interest to architects and engineers. The design was the response of engineering consultants Loder & Bayly to a university requirement that provision be made for the planting of trees above the car park. ▼



devoted to agricultural science activities.

Our buildings are primarily constructed of brick, and our primary energy source is electricity derived from natural gas. Most of our heating is via hot water reticulation systems. Air conditioning is necessary on only a handful of days each year when the temperature exceeds 40° C (104° F). Consequently, air conditioning is only provided to a few specific buildings that have high concentrations of research or to library buildings.

The property and buildings department consists of 230 employees who are members of a support staff totaling 2,600 people. There is an additional 1,700 members of the academic staff.

My primary concerns as a facilities manager include improving our strategic planning processes to ensure that we have a workable forecast of future space needs. Lack of funding for all activities, but especially deferred maintenance, results in some fairly tough choices. Our backlog of maintenance and refurbishment is not aided at all by a voracious legislature that passes laws and subordinate regulations with little heed as to how they will be implemented.

History

The university was established in 1853 (eighteen years after the first settlement in Victoria) as almost a direct result of the financial state of the colony following the 1840s Gold Rush. There were then only five other universi-

ties in the British Empire, including Sydney University in Australia. The university has grown from three academic staff members and eleven students in 1853 to the 25,000 EFTSU students and 4,300 staff.

A comprehensive landscaping program in accordance with the university's master plan has been undertaken, resulting in one of the most attractive campuses in Australia (in fact, winning an Architectural Urban Design Award in 1984). Campus buildings reflect the building trends at the time of their completion; therefore, our structures range from stone buildings to red-brick buildings to the current fad of beige buildings.

Although a lovely and varied campus, one of the limitations of our site is the lack of service tunnels between buildings. Instead, we have relied on area plant works serving up to ten or twelve surrounding buildings.

We have just completed our last capital works project. It is an information tech-

nology building valued at \$25 million. Other recent achievements include recasting many of our lecture theaters to incorporate all the modern audiovisual aids, thus encouraging our lecturing staff to present the most relevant computer-based material to their students. ■



▲ "SUN RIBBON" abstract sculpture in welded steel by distinguished sculptor Inge King.

HIGH LEVEL WINDOW WASHING FAST - SAFE - ECONOMICAL



Tired of putting your regular building maintenance people up on ladders or scaffolding to wash windows. We've got a better idea! Telescoping Tucker High Level Window Washers allow a single operator standing on the ground to wash and rinse windows up to 45 feet high and only two operators are needed to reach to 83 feet. All models connect to a standard garden hose and can save 70% or more washing time per window.

Free trial offer available on specific models.

TUCKER MANUFACTURING CO., INC.

P.O. Box 848

Cedar Rapids, Iowa 52406-0848

Toll Free 1-800-553-8131

FAX 1-319-366-7792

Data Base Update

Howard Millman

Surviving the Maintenance Software Maze

Projects always take longer and cost more than you originally thought they would. Searching for maintenance management software is no exception. You can expect the effort to take you longer than the time you spent courting your first spouse, and to cost more than you spent on all your honeymoons.

What's even more frustrating is the

time-consuming nature of the software search. Typically, competent investigations require from three months to one year. One Midwest university system spent nearly three years researching software.

Thomas Marketing proposes a solution. From the same publisher of *Thomas Register* and *Industrial Equipment News* comes a two-part source called the *CMMS User Handbook* and the *Computerized Maintenance Management Software Directory*.

The two publications neatly complement one another. The eighty-plus-page user handbook consists of non-product-specific information on how to justify, select, and implement maintenance management software. It offers several flow charts and graphs to illustrate the relationship between CMMS elements. It also includes numerous fill-in-the-blank checklists. To the authors' credit, they consider technical, financial, and political factors in their implementation strategies. Few things are left to chance. The handbook concludes with a three-part glossary and advice on how to structure a request for proposal (but no actual RFP samples).

Thomas's encyclopedic 340-page directory/comparison guide picks up where the user handbook ends. You can now begin to apply the handbook's general suggestions to locate specific vendors and products. The authors took pains to make the search as painless as possible. Easy though it is, don't expect a no-brainer.

The directory consists of eight cross-referenced sections describing 170 applications from 130 vendors. Where you begin your investigation depends on what information you already have. Do you have the name of a vendor? Then start with Section B, Suppliers. If you know the name of the product, begin in Section I, Detailed Descriptions. When you compile your list of products and want to find out more about the vendors, look in Section H, Detailed Supplier Information. Here's where you begin indulging in the arcane art of fortune telling. With some coaxing, the statistics here will reveal some insight into the vendor's stability, the number of employees, revenue distribution, and markets they play to.

One Size Never Fits All

There's a lot of time-saving information in here, but you need to read between the lines. For instance, there's a firm listed that has been in business for ten years and sold only one maintenance system. Hear any alarms going off? In another instance, some vendors declare their software will work equally well everywhere. Now, I cannot understand how maintenance software suitable for an offshore oil rig works as well for a medical center in Boston or a secondary school in Kansas. Sorry, I don't think so.

Lacking any strong precommitment to specific vendors or products, your best starting point is Section C, Matrix of Computing Platforms. Here you first decide what operating system and hardware you want your system to operate on (DOS, Windows, Apple, mainframe, Unix), then read down to the names next to the bulleted column marks.

Here's where I have some problems, not so much with the directory, but with the vendors. All of the information is provided by the vendors, and

Unparalleled grandstand achievement.



The trademark of Southern Bleacher.

Grandstands from Southern Bleacher will assure you of the highest quality and best value in design, engineering, manufacturing and installation. Since 1946 the name Southern Bleacher has stood for unparalleled achievements in custom grandstands, stadium seating and portable bleachers.

 **Southern BLEACHER
COMPANY**

Call Toll Free: 1-800/433-0912 In Texas Call: 817/549-0733
P.O. Box One, Graham, Texas 76046 FAX: 817/549-1365

Howard Millman is a systems integrator with twenty-five years of experience in facility management. His firm, Data Systems Services, is based in Croton, New York.

we're asked to believe them. But some vendors exaggerate.

For example, with Windows. Several vendors of nongraphical DOS applications claim their products run under Windows and are therefore Windows applications. Ain't so. Every DOS product can run under Windows, but that does not transform it into a Windows package. So the statement is misleading. A few (perhaps a dozen) vendors produce true Windows applications, and the rest of the vendors are exaggerating. The bottom line is, as always, *caveat facilitatum emptor* (let the facility manager beware).

Armed with the directory, however, you're an enlightened consumer—meaning you know how many more pitfalls you need be wary of.

This is the second incarnation of the guides; they were originally published in 1991. Cost of both publications is \$315. Available separately, the directory costs \$290, the user handbook costs \$62. All prices include shipping. Purchasers with prior experience using maintenance management software, and have the arrow holes in their back to prove it, might consider just opting for the directory.

Thomas Marketing can be reached at 212-629-1111, or fax 212-629-1584.

World's Cheapest PM Software

What software offers a nifty preventive maintenance module, will run on any old PC with a plug, and costs just \$595? Answer: Josalli's Preventive Maintenance System.

Sometimes all you need is a little help with scheduling, tracking repairs, or generating simple reports. Josalli's PM System delivers an ample array of features despite its mini price. It schedules preventive maintenance based on calendar settings, hours, or demand. Delayed some PM activities? Then reschedule them based on the last actual, not scheduled, service date.

Reports, while not configurable, will answer your who's-doing-what-and-where questions. Reports offer nearly a dozen views of open and closed orders, scheduling, equipment history, task descriptions, and equipment master files. Since it's written in dBASE, the program will output straightforward text and ANSI graphics to dot matrix and laser printers.

The software enables you to rename

the fields on the main menu screen. If you don't like the word "plant," then substitute "building" instead. The equipment ID field accepts sixteen characters, just about enough to enter meaningful mnemonic IDs instead of indecipherable numeric codes.

For sophisticated program changes, Josalli provides custom programming services at \$60 per hour. You might want to authorize some custom programming to enhance the software's impromptu work order capability. The way it's presently set up, you can only enter work orders on equipment in the PM data base. That excludes, for instance, rooms and leaking faucets.

For a PM system to function you need access to spare parts and materials. In addition to the PM System, Josalli offers an integrated companion program, Inventory Management. Priced at \$300, it handles spare parts and stockroom management tasks.

With the money that Josalli's (or almost any computerized maintenance management program) will save you, you could even commit to and sustain a consistent PM program. Josalli can be reached in Enka, North Carolina at 704-252-9146. ■



Gilsulate® 500^{XR}

**Thermal Insulation and
Protection System for
Underground Pipes Operating
at 35° F to 800° F**

- District Heating & Cooling
- Cogeneration
- Retrofit
- Hydrophobic
- Load Bearing
- Computerized Heat Transfer
Calculations and Design Reviews
- Engineered Drawings

For complete material and design
assistance contact:

American Thermal Products, Inc.
9220 Bonita Beach Rd. #111
Bonita Springs, FL 33923
800-833-3881

The Bookshelf

Fund Raising

The Campus Green: Fund Raising in Higher Education, by Barbara E. Brittingham & Thomas R. Pezzullo. Washington: ASHE-ERIC Higher Education Report No. 1, 1990. Washington: School of Education and Human Development, George Washington University, 1990. 128 pp., \$17, softcover.

Fund raising has become an important field of concentration in scholarly literature in several fields, including public relations and political science, during the past two decades. Not surprisingly, the notion that fund raising also affects colleges and universities has invaded higher education literature; *The Campus Green* is a report to the higher education community that analyzes this topic. The monograph is one of the prestigious ASHE and ERIC Clearinghouse on Higher Education reports on higher education issues. Topics are identified by a national survey, noted scholars and practitioners write the reports, and expert editors and advisors review the manuscript before publication. *The Campus Green* represents the first complete synthesis of the literature and experience concerning philanthropy and fund raising in higher education in the United States.

Barbara Brittingham and Thomas Pezzullo have furnished the academy with a comprehensive study on the status of fund raising in higher education. The report, prepared in conjunction with the Council for Advancement and Support of Education (CASE), indicates "that private support has become increasingly important to American institutions in the last two decades." The authors also suggest that "the future will be characterized by more formal and centrally planned fund raising programs, greater use of marketing principles, broader acceptance of an exchange model of donors' behavior (rather than an entirely altruistic one), and



wider competition for private funds from every type of institution, including, more recently, public two-year colleges."

The book is divided into five main sections covering the American education tradition of private philanthropy; organization and costs; donors' behavior and their motivation; consideration of ethics and value in fund raising; and analysis, implications, and recommendations. Each section is carefully developed, and the reader is presented information concerning changes and trends in fund raising, including current research on spending on higher education, the behavior of donors and their predisposition for participating in higher education contributions, and the major ethical issues faced by fund raisers. Concerning ethical issues faced by fund raisers, the authors report on the 1985 conference "Greenbrier II," a meeting sponsored by CASE that marked the beginning of increased attention within the field of fund raising in higher education to ethical issues.

The message of the book is contained in two summaries: the notable changes and trends in fund raising, and the authors' recommendations for institutions of higher education. The changes and trends discussed are:

1. Traditional church-affiliated and individual and personal solicitation has been replaced with increased direct institutional appeals of an organizational and professional nature.
2. The notion of charity has been replaced with philanthropy, and theories of donors' behavior have changed accordingly.
3. While once considered an adjunct to the duties of the president or a few trustees, fund raising has become a central institutional activity.
4. Though once limited to independent colleges, fund raising in public higher education has become accepted.

The recommendations for institutions include:

1. Consider sources of private support strategically, deciding which sources have the best potential for a particular institution.
2. Designate some private support for areas that will build students' understanding of the importance of private support for colleges and universities, and help shape their future behavior as alumni.
3. Work to strengthen institutional traditions of philanthropy and community service.

The Campus Green describes an aspect of higher education that is considered undignified by many members of the academy. This is unfortunate, because philanthropy and academic pariahdom have been an integral part of higher education in the United States since John Harvard started the trend in 1636. While not completely dependent on the charity of strangers, higher education has

consistently been the Blanche DuBois of the plot, always courting the altruistic and the well-heeled. Historians of higher education, especially Jesse Sears at Columbia, and Merle Curti and Roderick Nash at Wisconsin, have given the academy the fascinating tale of how philanthropy and fund raising were so important to the early development of higher education in America. Private donations have been, and will continue to be, an essential funding component of higher education in the United States. While physical plant divisions may not elect to compete with the academic community for these scarce resources, it is important that all facilities managers understand the present state of fund raising in colleges and universities, as explained in *The Campus Green*.

This book is another example of scholarly literature that has significant practical value for higher education administrators. It will probably produce additional research regarding fund raising, a new area of focus in the study of higher education programs. For these reasons, *The Campus Green* is recommended for college and university committees throughout the country.

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

—John M. Casey
Manager, Engineering Department
University of Georgia
Athens, Georgia

In Brief

Empowered Teams is a how-to guide to team management. The book is based on a survey of 500 companies and offers advice on how to overcome an organization's resistance to change, selecting team leaders, training teams, and expanding the focus of the team. The book, published in 1991, is 276 pages and costs \$29.95. For more information, contact Jossey-Bass Publishers, 350 Sansome Street, San Francisco, CA 94104. A copy of this publication is available for review. If you are interested, please contact Stephanie Gretchen at the APPA office, 703-684-1446.

Job Corner

Director Of Engineering

Reporting to the General Manager of Plant & Services, the Director manages a full range of engineering services including civil, electrical, energy, mechanical and environmental. Administers consultant and construction contracts. Responsible for operation of central utility plants. Annual budgetary responsibility is in the \$10M to \$20M range. Incumbent supervises a staff of 55 including 14 professionals.

Requires a BS degree, advanced degree preferred. PE registration and 10+ years of increasing responsibility with minimum of 5 years supervisory experience. Excellent benefits package. Send resume and salary information to: **Req #HPAC-8624-DJ, Office of Human Resources, Clio Hall, Princeton, NJ 08544.**



Princeton University

Equal opportunity/affirmative action employer.

Job Corner Deadlines

Job Corner advertisements are available to any nonprofit institution with a facilities-related position opening available. 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 logo with your display ad, please mail it into APPA by the ad deadline. APPA does not accept faxed logos.

Upcoming Job Corner deadlines are **November 10** for the December issue, **November 24** for January, and **January 10** for February. 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, 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 or to receive a Job Corner brochure.

UNIVERSITY OF MIAMI

ASSISTANT DIRECTOR FOR PHYSICAL PLANT OPERATIONS AND ASSISTANT DIRECTOR FOR RESIDENCE HALLS MAINTENANCE

Assistant Director for Physical Plant Operations—This position reports to the director of physical plant and is a key member of the facilities administration team. Specific areas of responsibility include the physical plant customer service center, carpentry shop, painting shop, plumbing shop, key shop, and zone maintenance personnel. Incumbent manages the operation of the work order management system, approves all requisitions for materials, and will handle personnel issues.

The successful candidate must possess strong managerial, leadership, communication, and interpersonal skills. Must be able to oversee numerous projects while maintaining overall budgetary and scheduling control. Specific attributes include exceptional customer service skills, and a good working knowledge of one or more of the aforementioned trades. This is a position of high visibility, responsibility, and impact. The assistant director works closely with various UM administrators, facilities managers, outside engineers, architects, and contractors to successfully accomplish projects and goals.

Assistant Director for Residence Halls Maintenance—This position reports to the director of physical plant and is a key member of the facilities administration team. Specific areas of responsibility include overseeing all maintenance and special projects for all residential facilities. Specific attributes include exceptional customer service skills, strong leadership abilities, and a good working knowledge of one or more of the maintenance or construction trades. Incumbent works with in-house personnel and outside contractors to perform a variety of projects and will conduct ongoing inspections of buildings, equipment, grounds, etc., to develop and implement a successful housing maintenance program. The assistant director is also responsible for budget and personnel matters for this area and will serve as liaison to housing office administration.

Both positions require a bachelor's degree with a minimum of five years of experience in the construction/maintenance trades, or equivalent of appropriate education experience. The University of Miami offers a competitive salary and an excellent benefits package. Interested candidates should submit a letter of interest, resume, and salary history to

Michael White, Director of Physical Plant

University of Miami

1535 Levante Avenue, Room 205

Coral Gables, FL 33146-2820

An affirmative action/equal opportunity employer. Women and minorities are encouraged to apply.

Coming Events

APPA Events

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

Oct. 18-19—Facilities Audit Workshop. San Antonio, TX.

Nov. 14-16—Institute for Facilities Finance. Alexandria, VA.

Jan. 16-21—Institute for Facilities Management. Orlando, FL.

Jul. 10-13—1994 Educational Conference & 81st Annual Meeting. San Antonio, TX.

Aug. 21-26—Institute for Facilities Management. Denver, CO.

Other Events

Oct. 26-27—Environmental Laws & Regulations Compliance Course. Alexandria, VA. Contact: Government Institutes, Inc., 4 Research Place, Suite 200, Rockville, MD 20850; 301-921-2300.

Oct. 26-28—16th World Energy Engineering Congress. Atlanta, GA. Contact: WEEC, P.O. Box 1026, Lilburn, GA 30226; 404-925-9648.

Oct. 27-29—Lead Tech '93. Washington, DC. Contact: IAQ Publications, 4520 East-West Highway, Suite 610, Bethesda, MD 20814; 301-913-0115.

Oct. 28-29—8th Annual IDHCA Cooling Conference. Tulsa, OK. Contact: IDHCA, 1101 Connecticut Avenue, NW, Suite 700, Washington, DC 20036; 202-429-5111.

Oct. 31-Nov. 3—23rd Annual Educational Conference and Show of the National Institute on Park and Ground Management. Denver, CO. Contact: National Institute, P.O. Box 1936, Appleton, WI 54913; 414-733-2301.

Nov. 1-3—Estimating for Electrical Contractors. Raleigh, NC. Contact: Susan Sheehan, OCE&PD, Box 7401, McKimmon Center, North Carolina State University, Raleigh, NC 27695-7401; 919-515-2261.

Nov. 4-5—Architectural Acoustics and Noise Control Standards. Chicago, IL. Contact: Tina Falkenstein, ASTM, 1916 Race Street, Philadelphia, PA 19103; 215-299-5480.

Nov. 21-23—Building With Value '93: A Resource-Efficient Construction Conference and Trade Show. Seattle, WA. Contact: Project Manager Kathleen O'Brien, P.O. Box 10705, Bainbridge Island, WA 98110; 206-842-8995.

Nov. 14-18—PGMS Annual Conference and Green Industry Expo. Baltimore, MD. Contact: PGMS, 120

Cockeysville Road, Suite 104, Hunt Valley, MD 21031; 410-584-9754.

Nov. 16-17—Environmental Laws & Regulations Compliance Course.

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

Nov. 18—Course for Asbestos Inspectors and Management Planners—full-day. Berkeley, CA. Contact: University of California/Berkeley, UC Berkeley Extension, 2223 Fulton Street, Berkeley, CA 94720; 510-643-7143.

Nov. 18—AHERA Refresher Course for Asbestos Inspectors—half day. Berkeley, CA. Contact: University of California/Berkeley, UC Berkeley Extension, 2223 Fulton Street, Berkeley, CA 94720; 510-643-7143.

Nov. 22—Contractor/Supervisor Refresher. Austin, TX. Contractor: The University of Texas at Arlington, Center for Environmental Research & Training, Box 19021, Arlington, TX 76019-0021; 817-273-3878.

Dec. 1-2—Managing Asbestos in Buildings. Arlington, TX. Contact: The University of Texas at Arlington, Center for Environmental Research & Training, Box 19021, Arlington, TX 76019-0021; 817-273-3878.

Dec. 2—Training Skills for Environmental Health & Safety Managers. Denver, CO. Contact: Government Institutes, Inc., 4 Research Place, Suite 200, Rockville, MD 20850; 301-921-2345.

Dec. 2—Managing Cultural Diversity in Building Cleaning Operations. Los Angeles, CA. Contact: Cleaning Management Institute, 13 Century Hill Drive, Latham, NY 12110; 518-783-1281.

Dec. 5-7—Trees and Utilities National Conference: Promoting Peaceful Coexistence. Nebraska City, NE. Contact: The Arbor Day Institute, P.O. Box 81415, Lincoln, NE 68501-1415; 402-474-5655.

Dec. 7-8—Environmental Laws & Regulations Compliance Course. Scottsdale, AZ. Contact: Government Institutes, Inc., 4 Research Place, Suite 200, Rockville, MD 20850; 301-921-2300.

Dec. 7-10—CAUSE '93 Annual Conference. San Diego, CA. Contact: CAUSE, 4840 Pearl East Circle, Suite 302E, Boulder, CO 80301; 303-449-4430.

Dec. 7-10—Housekeeping Management School. San Francisco, CA. Contact: Cindy at Roesel, Kent, Beddow & Associates, 4343 Shallowford Road, B1, Marietta, GA 30062; 404-998-1691.

Dec. 14-15—Slashing Your Facility's Utility Bills. San Antonio, TX. Contact: Kay James, Clemson University, Office of Professional Development, P.O. Box 912, Clemson, SC 29633; 803-656-2200.

Jan. 27—Inland Northwest Turf and Landscape Trade Show. Spokane, WA. Contact: Julie Boyce, Trade Show Coordinator, Inland Empire Golf Course Superintendent's Association, 1708 North Lee Street, Spokane, WA 99207; 509-534-4161.

Index of Advertisers

ABM	11
American Thermal Products	47
ANADAC, Inc.	4
APPA Publications	cover 4
APPA Information Services	39
APPA Publications	50
Copper Development Institute	cover 3
D&L, Inc.	13
Data Systems	9
DriTherm Inc.	29
Energy Controls, Inc.	12
Exeter Architectural Products	8
ISES Corporation	2
Johnson Controls	51
MCC Construction	cover 2
Orr-Schelen-Mayeron Associates	52
Southern Bleacher	46
TMA Systems, Inc.	37
Tucker Manufacturing Co.	45
Virginia Polytechnic Institute	7

There is always a
need to get back to
basics


MANAGEMENT BASICS

This book delves into such topics as the changing role of the facilities manager, presupervisory training, negotiating the labor contract, long-range master planning, and more.

The book is 140 pages and costs \$22 for APPA members (\$30 for nonmembers).

Send orders to:
APPA Publications
Dept. MBAD, P.O. Box 1201
Alexandria, VA 22313-1201

Orders must be prepaid. Call the APPA office for more information, (703) 684-1446.

A photograph of a female student with glasses, wearing a white t-shirt, sitting at a desk in a classroom. She is leaning her head on her hand and writing on a piece of paper. In the background, another student is standing near a desk. The scene is dimly lit, suggesting it might be late afternoon or evening.

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.



AGING FACILITIES...

LIMITED FUNDS...

VOLATILE FUEL PRICES...

UNCERTAIN FUTURE?

When faced with tough facility infrastructure planning decisions, choose a dynamic team with proven ability to work together successfully to develop and implement innovative solutions.

- Least Cost Planning
- Feasibility Studies
- Cogeneration Analyses
- Public Procurements
- Project Financing Options
- Cost Recovery

- Environmental Permitting
- Labor Relations
- Risk Management
- Contract Negotiation
- Fuel Procurement
- Privatization

Orr-Schelen-Mayeron & Associates, Inc.
SVBK Consulting Group
O'Neill, Burke, O'Neill, Leonard & O'Brien

OSM
Orr
Schelen
Mayeron &
Associates, Inc.
Engineers • Architects • Planners • Surveyors
Contact: James J. Sebesta
300 Park Place Center • 5775 Wayzata Boulevard
Minneapolis, Minnesota 55416-1228
Tel. (612) 595-5757 FAX (612) 595-5773

SVBK Consulting Group
Financial, Engineering & Management Consultants
SVBK
CONTACT: SHEREE L. BROWN
201 SOUTH ORANGE AVENUE, SUITE 1020 • ORLANDO, FL 32801
TELEPHONE (407) 872-1500 • FAX (407) 843-3200
CHARLOTTE • DENVER • ORLANDO

**O'NEILL, BURKE, O'NEILL
LEONARD & O'BRIEN**
Energy, Utility and Environmental Law
Contact: PETER H. GRILLS, 800 Norwest Center
55 East Fifth Street, St. Paul, Minnesota 55101
(612) 227-9505 FAX (612) 297-6652

IT'S A LAW OF PHYSICS: COPPER SAVES YOU MONEY.

I^2R = Costly heat loss.
Electrical equipment that contains more copper
runs cooler and saves money.

Did you know there's a law of physics that says all electrical equipment wastes energy in the form of heat? It's expressed as I^2R (where I = current and R = resistance).

And it can cost your company more than just wasted energy dollars. It can dramatically reduce your productivity — and profitability.

But you can break this law — with copper! The more copper your electrical equipment windings and cabling contain, the less costly energy you'll lose as heat. And the more you can put to



work. That's because copper is the most efficient conductor available.


Copper upsizing — using heavier gage conductors — also minimizes costly operations problems, particularly downtime due to overheated or failed equipment.

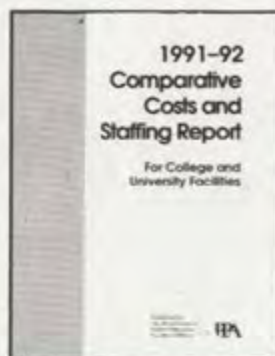
Reliability and service life of electrical equipment are substan-

tially increased. And there can be significant savings in the cost of air handling and cooling no longer needed.

Sit down with your plant engineer or facilities manager. Compare the costs. Compare the savings. You'll find that energy efficient electrical equipment and cabling put the I^2R law on your side.

For more information, call 1-800-CDA-DATA. Or write the Copper Development Association Inc., 260 Madison Avenue, New York, NY 10016.

 **COPPER.** The smart choice.



**Comparative Costs and Staffing
Report for College and
University Facilities**

Softcover, 336 pp.

ISBN: 0-913359-72-6

\$40/APPA members; \$90/all others.

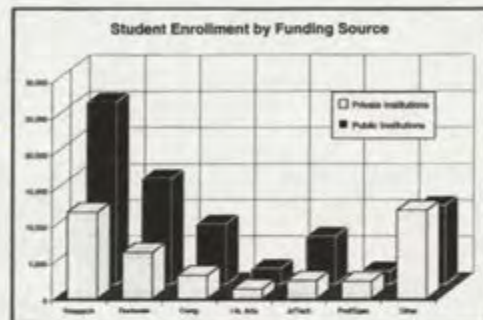
APPA's newest edition of *Comparative Costs and Staffing Report for College and University Facilities*

has been completely updated to provide the most recent figures available on facility operating costs in the U.S. and internationally.

Every effort has been made to ensure that this report is as meaningful, reliable, and user-friendly as possible.

The responses have been checked and corrected, by hand and by computer. Taken together, the data present a useful picture of college and university costs and staffing.

More than 300 pages of information are presented in a revised, easy-to-read format.



Comparative Costs and Staffing includes:

- profiles of more than 500 institutions
- institution costs and the building area served for each function category
- salary information and the number of employees for each job title
- hourly shop rates and whether employees are unionized or contracted
- average utilities costs.

To Order:

All orders must be prepaid in U.S. funds. Please add \$8 for shipping/handling. Enclose check (made payable to APPA) and mail to:

APPA Publications

Dept. CCSAD • P.O. Box 1201 • Alexandria, Virginia 22313-1201

Orders are shipped via UPS; please allow 3-4 weeks for delivery.

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

Facilities Manager

1446 Duke Street
Alexandria, Virginia 22314-3492

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