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# Planning, Design, and Construction in the BOK

By William A. Daigneau

Many, many years ago someone told me that the value I brought to an organization was not that I had any better answers, but that I knew what questions to ask. Certainly I have tried many approaches to find the right answers to various challenges or problems, some with success, some with little or none. But over the years, while my quiver of the “right answers” has remained relatively small, my quiver of “right questions” has burgeoned! And with it has grown my skill at identifying those better solutions that just might possibly succeed, while avoiding those that would likely lead to dead ends, or worse yet, disaster. Some might label that ability as “knowledge” or “expertise.”

The breadth of skill and knowledge required to be an effective facilities manager, let alone an institution’s chief facilities management officer, is intimidating. We must not only have the prerequisite background to understand building systems and operations, but must also be good at human resource, financial, process, information, construction, energy, and customer relations management. Then there’s that whole leadership thing. Since most people spend an entire lifetime focused on just one of the many areas in which a facilities manager is expected to perform, the dilemma of equipping an individual with high levels of skill in all these areas is quite formidable.

So in undertaking the updating and publication of APPA’s fourth edition of its facilities management manual, the APPA *Body of Knowledge* (BOK), the focus has been on providing the

educational facilities professional with the essential information that leads to a complete solution. However, it does not provide exhaustive details on each subject. To perform exceptionally well in a specific area of expertise, one must either become more proficient in that area (for which the BOK provides reference material, as well as APPA’s other educational resources), or the facilities manager must recruit and organize a team of professionals that possess that proficiency.

**BASED ON THE MISSION OF THE INSTITUTION AND THE CONDITION AND PERFORMANCE OF ITS SPACE, THE IDENTIFICATION OF SPACE DEFICITS AND LONG-TERM NEEDS CAN BE DEVELOPED, LEADING TO THE NEXT STEPS IN FACILITIES PLANNING.**

Thus the section on Planning, Design, and Construction (PDC) of the BOK is devoted to orienting the facilities manager on the fundamental information necessary to effectively manage and lead this area, and the key details of each subject that are essential for effective performance. It does not purport to educate an individual to the point that they would be able to deliver the required services themselves without further study or experience.

The PDC section is organized into three subject areas as follows:

## PLANNING

As has been said, if you don’t know where you are going, any road will take you there. Effective planning processes

help you define where you are going and how to get there. For any facilities professional, a complete understanding of the elements of the planning process is a critical to their and their institutions’ success.

Before a shovel hits the ground, an institution must consider the types and amount of space it requires to achieve its mission and if it is utilized productively. In the chapter **Space Planning and Administration**, Joe Bilotta, a

higher education planning consultant, develops a holistic view of space management. His IOU approach (Indoor, Outdoor, Underground) helps facilities managers understand that space is an important asset and all aspects of it must be planned for and managed. Based on the mission of the institution and the condition and performance of its space, the identification of space deficits and long-term needs can be developed, leading to the next steps in facilities planning.

That next step is the development of a campus master plan. Robert Kitamura of California Polytechnic has led a team of exceptional planning professionals in writing the chapter on **Master Planning**. Their excellent work describes

both the critical elements of a master plan and the process required to prepare one. A complementary piece of master planning that is often overlooked by many institutions is a long-term infrastructure plan. How people will actually use a campus and rely on its network of utilities, roadways, parking, service access, and greenscape must be carefully considered and planned for. In the revised and expanded chapter on **Infrastructure Planning**, Frederick Mayer (retired) of the University of Michigan covers all of the details beyond the scope of most master plans, those necessary to build and operate a campus environment “that works!”

As a campus grows and obsolete facilities need to be replaced, plans for new buildings and infrastructure are developed. The initial step in constructing these new or renovated facilities is the preparation of a detailed description of the programmatic needs to be met and how programs will function in the proposed space. Ira Fink, the well-respected space-planning consultant, explains the importance of a comprehensive needs analysis in his chapter on **Programming**. Particularly helpful is his description of the skills necessary to help the programmer separate fact from fiction when defining needs versus wants.

Once the programming has been completed and the space requirements defined, building scope and location is determined with guidance from the master plan. The objective for the FMer is to fully understand the components necessary to achieve a fully functional building that meets the needs of the occupants as well as the institution. Joe Bilotta’s chapter on **Site Planning and Development** illuminates those aspects of a project often overlooked, such as special soil conditions, regulatory issues, and other aspects that affect total project cost.

A reasonable estimate of the total cost of projects is used not only to guide project management but also for capital budgeting and financing. The chapter

on **Capital Budgeting** by Alan Matthews covers the identification, prioritization, and funding of an institution’s total demand for capital. It is important for FMers to understand financing since there are a number of issues that may arise and restrict either the total available funding or impose specific requirements on individual projects.

With plans well established and funding secured, the next section of the PDC covers the elements of actual project implementation.

## DESIGN AND CONSTRUCTION

The first important and necessary task in constructing facilities improvements is to organize the effort. David Allard, a well-experienced higher education architect, discusses effective project organization and project controls in his chapter on **Project Organization and Management**. The people that manage the projects and the tools they use to control cost and schedule often determine a project’s success. This chapter is a must read before embarking on any project.

The second important task is the selection of the project delivery methodology. Today the FMer has a number of options, and Robert Smith of the University of Arizona covers those options in his chapter on **Project Delivery**, discussing their advantages and disadvantages. With a delivery method selected, a project moves into the design phase. Michael Haggans, a contributor to the last version of the manual, deals with the sometimes confusing and complex developmental design process in his chapter on **Design Management**.

Rounding out this section are informative chapters that cover the basics on managing the actual construction as well as the final commissioning and activation. The chapter on **Construction Management** by Jeffrey Gee of Swinerton, Inc. covers all the essentials but has a particularly good discussion on project communications and surety, two areas often left to others but with significant effect

on a project’s success. Richard Casualt, a recognized expert in building systems commissioning, provides comprehensive coverage of commissioning in his chapter on **The Building Commissioning Process**. He makes a convincing argument that while commissioning may start near the end of a project, the initiation of commissioning activities should begin during the design phase to ensure maximum success.

While the Planning and the Design/Construction sections cover the most important essentials, there are a number of additional subjects important to the FMer. These are covered in the last sections.

## SPECIAL TOPICS

One of the hottest areas for discussion amongst FMers is the emerging technology of Building Information Modeling (BIM). Why? BIM, already considered a valuable tool during the design and construction process, is now believed by many to be as important to future building operation and maintenance. Jim Jacobi, whose firm Walter K. Moore is on the forefront of BIM adoption, introduces this technology and explains how it can be a significant aid to both the design/construction professional as well as the project owner in his chapter on **Building Information Modeling**.

Then there is the whole topic of “green” in construction. The chapter on **Sustainable Design and Construction** by Andrew McBride at the University of Richmond is not exhaustive but gives the reader a good grounding by explaining the LEED criteria. Whether or not one seeks certification, the criteria are useful for considering all aspects of sustainable design and construction.

Got a problem with the project budget? **Value Management** by Steven Thweat of Emory University will help you get ahead of this problem by avoiding the most common pitfalls of value engineering, by looking at value in a more complete way. I myself learned a lot from his chapter.

Although construction of new build-

ings is episodic for most of us, renovating them is not. **Renovations** by Mark Thaler, an architect with the architectural/engineering firm of Einhorn Yaffee Prescott, reviews all the special circumstances and unique challenges encountered in building remodeling and renewal, based on his years of experience in this arena. Since much of the campus renovations may be performed with in-house staff, Robert Unrath at the University of Missouri covers both its advantages and disadvantages in his chapter on **In-House Design/Construction Services**. Those that have or are contemplating such services will especially benefit from his discussion on defining your “niche.”

Of course, an important aspect of facilities management is acquiring or disposing of property, leasing space as a bridge to long-term facilities development, and providing ancillary facilities such as research parks, housing, park-

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ing, or retail venues sought by students. The key principles necessary to deal in this environment are covered in the chapter on **Real Estate** by Jeffrey Lipton (retired) from the University of Colorado. Does a deal sound too good to be true? Read his sections on Risk Management, Due Diligence, and Environmental Risks.

**SUMMARY**

Taken all together, the chapters in the PDC section of the BOK will give the FMer a comprehensive overview of planning, design, and construction processes. The chapters have been written by experts in their fields, reviewed for

accuracy by similarly knowledgeable experts, and come with a complete set of reference sources for more detailed information. While many of us rely on staff or consultants experienced in the details of PDC, we nonetheless are expected to ensure these functions are performed ably and professionally at our institutions. For the newly promoted or even the seasoned facilities manager, the PDC section will provide the base knowledge required to make sure that you are able to “Ask the right questions”! ☛

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