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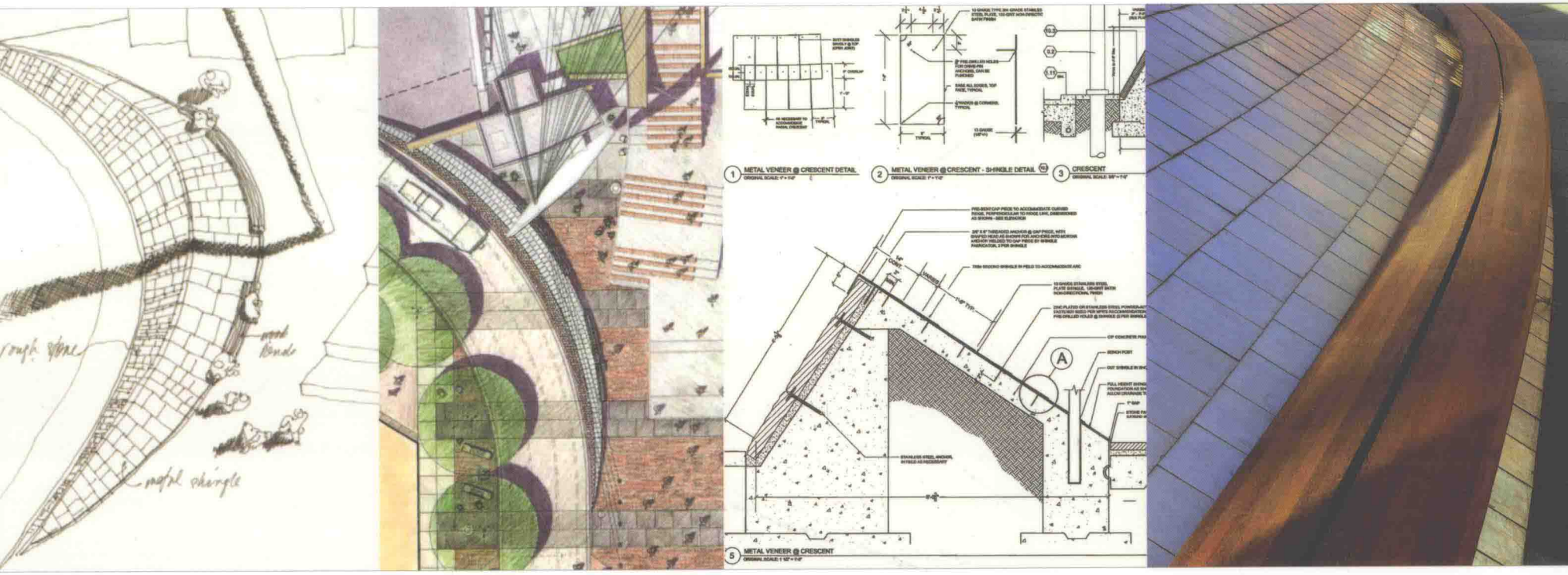

LANDSCAPE ARCHITECTURE DOCUMENTATION STANDARDS

PRINCIPLES, GUIDELINES, AND BEST PRACTICES

WILEY

Landscape Architecture Documentation Standards: Principles, Guidelines, and Best Practices

DESIGNWORKSHOP

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Principles, best practices and documentation requirements were gathered in extensive work sessions dedicated to very specific and detailed topics such as line-weight hierarchies and plan layout strategies. Exhaustive detail was elicited from project teams and the project documents they prepared. Initial versions of this document were prepared as part of an internal training course to educate professional landscape architects in a private-practice setting. These training courses, across a number of offices, were also used as forums to debate and develop additional content.

Over the course of several years, the guidelines were further developed and re-issued as improved and expanded versions. Quality Management Directors within the landscape architecture firm were asked to administer the application of the guidelines and solicit additional input and content. Peer reviews were conducted on early versions, whereby comments were collected from reputable landscape architects across the United States and university faculty responsible for teaching documentation practices.

The publication includes graphic documentation from several Design Workshop offices for projects and are used to guide teams in successfully completing project design and documentation in a variety of cities. These guidelines were applied to these projects.

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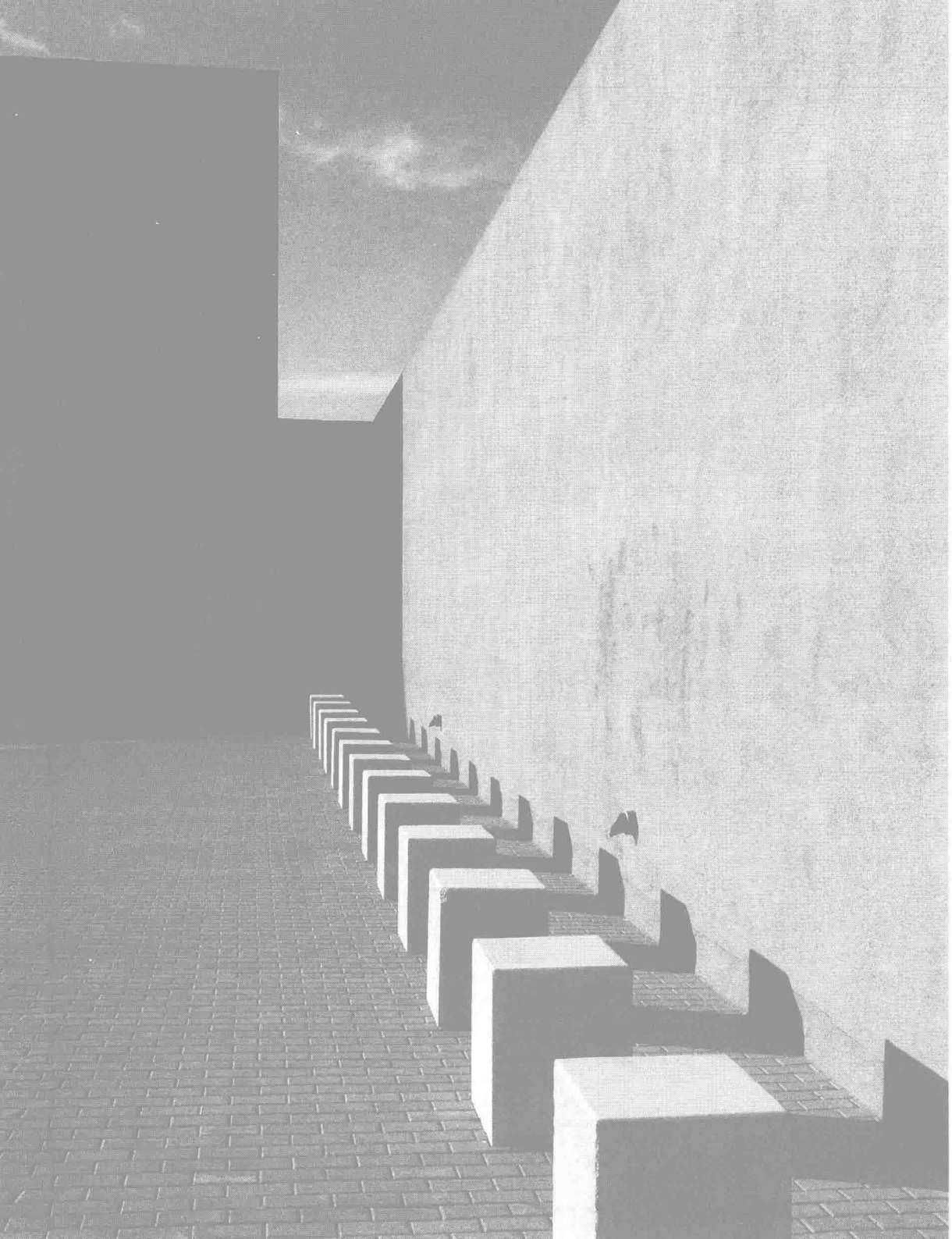
For supporting information including Glossary, Documentation and Quality Control Checklists, and Additional Drawing Requirements, please visit the book companion website at: www.wiley.com/go/landscapedocumentationstandards



SECTION 1

Establishing the Foundation

Introduction

Documentation Principles

Operational Principles

1 INTRODUCTION

BACKGROUND

In its relatively short American history, the role of landscape architecture has been broad, diverse, and impactful. Landscape architects have been influential in making the post-industrial city more humane and livable. They have broadened the duties of transportation networks and transformed the function of open space systems. They have defined and redefined what makes great communities. They have been integral to environmental progress and are conceiving new approaches for infrastructure to provide environmental and community benefits. Also, landscape architects have brought art and culture to many through their work. Moreover, their work has significantly benefited economic development in many cities and regions.

While the impact of landscape architecture has been impressive, the ongoing potential for this noble profession continues to materialize. Its potential can be even more transformative if it responds to the most critical global problems: economic, environmental, and social. Many of these problems languish at crisis level, and consequently, the opportunity for landscape architectural leadership is both critical and challenging. Innovation and change will be key components of this prodigious undertaking.

Solutions to problems will necessarily be derived from rigorous interdisciplinary analyses, research, and exploration. Solutions will be most sustainable if they are comprehensive in nature, deriving long-term synergies between prosperity, environmental healing, and improved quality of life. While much of the work of landscape architects is delivered figuratively in the form of plans, reports, and guidelines, the most decisive impact comes in the form of built work. The built work must be well executed, that is, perform well, in order to fulfill ambitious intent. Processes for translating objectives and ideas into built outcomes need to be advanced and carefully applied just as they are in other industries where vital products are delivered to market.

This book is intended to help advance and elevate these processes, as part of a broader effort to affect the role of landscape architecture in addressing global challenges.

Landscape Architects as Interdisciplinary Leaders

Landscape architecture and related disciplines such as planning and urban design are well positioned to address the most fundamental challenges faced by communities, cities, and nations around the globe. That will require elevating the role of the designer to the highest potential level. It will also require that theory and practice be well integrated.

Landscape architecture is continuing to mature and establish its importance in the design industry. There is growing awareness and support for the central role of built landscapes in accomplishing our highest-level ambitions: economic development, community building, environmental improvement, and even access to art and culture. While many subscribe to this broad definition of sustainability, fewer are successful in attaining the comprehensive pursuit.

The seriousness of these undertakings should be reflected in the depth and rigor of the landscape architectural design and documentation process. The premise suggests the critical need for effective translational relationships between theory and implementation. It will require an ongoing process of elucidation, evaluation, and improvement of design and documentation practices themselves.

This book defines clear processes and guidelines for delivering well-documented and well-built landscape architecture projects.

ELEVATING AND UPGRADING DESIGN AND DOCUMENTATION PRACTICES

The landscape architecture profession is mature and diverse but subject to wide-ranging levels of application. These conditions can result in varied and often underdeveloped delivery methods. Consequently, the profession needs to be committed to elevating and upgrading the processes by which it designs, documents, and constructs landscapes. This profession must continue to evolve and improve its practices in order to maximize potential contributions and doing so will require diligence.

Young and Evolving

Landscape architecture as a term was "invented by Gilbert Laing Meason in 1828 and was first used as a professional title by Frederick Law Olmsted in 1863."[1] Formal recognition was given to landscape architecture with the founding of the American Society of Landscape Architects in 1899 and the establishment of the first degree program at Harvard University in 1900.

Over the course of about 100 years, landscape architecture licensure requirements have been established in all 50 states, reflecting the profession's commitment to protecting public health, safety, and welfare. About 30 of these states maintain continuing-education requirements for its licensees. While licensure is very important, it represents a baseline set of core competencies for the landscape architect. As with all professions, ongoing improvements and collective development is necessary, building upon landscape architecture's historic adaptation to technology, market areas and community need.

A Diverse Profession

The profession practices across a diverse range of subjects; consequently, it is subject to some risk when delving into tangential subject areas. Uniquely, landscape architecture requires both generalized and specialized perspectives and skill areas. As generalists, landscape architects are positioned to lead multidisciplinary teams. As specialists, they can deliver tangible outcomes. Horticulture, social science, material sciences, agronomy, hydrology, ecology, graphic design, traffic analysis, and renewable energy represent some of the subjects that landscape architects address in their daily work.

In order to assimilate and coordinate these subject areas, landscape architects need to be sure that interdisciplinary design and documentation processes maximize benefits and minimize deficiencies.

Wide-Ranging Quality Levels

Landscape architecture is practiced across an extremely broad range of applications; there are those who seek to dramatically improve the human condition and those who solely produce Planting Plans. While most forms of practice are legitimate, many landscapes are not well designed, well built, or intended to accomplish high-level objectives. Uneducated landscape designers proliferate in many communities and cast some confusion on the profession. As an analogy, a landscaper to a landscape architect is what a security guard is to a national security expert. Both are important, but they operate on very different levels of execution.

As only a small percentage of buildings are constructed as LEED® buildings[2]; a similarly small percentage of landscapes are built to accomplish high-performance objectives as discussed earlier and as established by the Sustainable Sites Initiative.™ By elevating the purpose and quality of the design and documentation process, these trends may begin to improve.

PURPOSE OF THE BOOK

This reference book focuses on the key documentation needs of the landscape architectural design and Construction Documentation process. That includes both "design documentation" and "Construction Documentation" as well as all that which occurs in the transition from one phase to the other. Documentation requirements include those components necessary to explore and define design intent, logic, physical proposals, and ultimately, the specific components included within construction and bid documents.

"Documentation" herein generally refers to those diagrams, drawings, models, annotations, and narratives produced and sequentially presented within each phase of the design process. Five phases of the design and documentation process are included: Pre-Design, Conceptual Design, Schematic Design (SD), Design Development (DD), and Construction Documentation (CD). Key components, drawings, sheets, and documentation sets are described for each of these phases. For each of these elements, an explicit set of requirements is defined. Specifications are not described in detail within this edition of the book, although critical issues and relationships between drawings and specifications are highlighted. Documentation needs of the Construction Administration process are also not presently included.

While design process is integral to the development of landscape architectural

[1] "The Origin of Landscape Architecture." The Garden Landscape Guide. January 1, 2014. http://www.gardenvisit.com/history_theory/garden_landscape_design_articles/landscape_theory/origin_term.

[2] LEED (Leadership in Energy and Environmental Design) is a voluntary, consensus-based, market-driven program that provides third-party verification of green buildings. (http://new.usgbc.org/leed). As of April 2013, approximately 40,000 projects were registered as LEED certified.

documentation, this book should not be considered a design methods resource. Nor is the book intended to provide comprehensive technical systems information, such as construction detailing or landscape grading practices. This publication is not intended to function as a design graphics handbook. There are ample resources available for each of those areas of practice.

The book is not intended to mandate a standard or inflexible set of requirements, but rather offers a wide-ranging framework from which to draw best practices. Projects vary in scope and scale; not all projects will require all the documentation components included here. The principles from which the requirements are drawn are most important—explicit emphasis is placed upon documentation principles within the book.

INTENT OF THE GUIDELINES

These guidelines are intended to serve both academic and professional needs. In both realms, they may be used as a teaching tool, helping students and practitioners to understand the landscape architectural design and documentation practice. That process, together with associated graphic requirements, is taught within landscape architecture degree programs. These courses, due to time and to some degree resource limitations, do not typically cover the topic as comprehensively or in great detail.

Professionally, the young landscape architect is usually left to learn these requirements over long-term exposure to projects and through working with experienced staff. That instruction can vary in quality, range, and timeline. Continuing education opportunities focus in part on preparing for the Landscape Architecture Registration Exam, a state-based examination process, drawn from national competency standards established at the Council for Landscape Architectural Registration Boards (CLARB). That process is concentrated on selected Construction Documentation components and tasks and does not incorporate the full design and documentation process. While relationships and distinctions between different design and documentation phases are fundamental to landscape architectural practice, they are generally not taught with much emphasis in academic or professional settings.

These guidelines methodically present the subject matter in a comprehensive and explicit manner. A number of fundamental premises organize the current approach:

- Organizational and operational principles go a long way in clarifying the complexities of the design and documentation process.
- An explicit understanding of the purpose of each component (drawing or sheet) within the documentation set facilitates the development of content within that component.
- Interdisciplinary Construction Documentation cannot rely upon informal, intuition-based processes but should rather be based upon itemized sets of requirements, quality-control checklists and interdisciplinary coordination needs.

These premises suggest that each phase and all associated components of the design and documentation process will be made clear and meaningful. Clarity is initiated with a foundation of intent that can be logically applied from Pre-Design through Construction Documentation, resulting in superior built outcomes.

OBJECTIVES

The following objectives have been established for the guidelines as they apply to professional practice:

Orientation

Orientation refers to the possibility that a firm may adopt these guidelines, or an adapted version of these guidelines, for professional use. The guidelines will be used to orient the new landscape architect to the firm's expectations for executing projects. A prospective employee may also review the guidelines in order to evaluate his or her potential fit within the firm and determine a role for herself within the design and documentation process.

Project Management

The guidelines may be used to inform project management processes: a "road map" of the requirements for each phase of the design and documentation process. Project efficiency will improve with the use of these guidelines. Requirements for each sheet of the documentation process have been defined and can be followed by project teams as a self-management tool. The guidelines do not substitute for rigorous critical thinking, comprehensive quality management, and document reviews.

Quality Management

The guidelines may be used to guide the project quality-assurance review process. Quality assurance represents the specific review,

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coordination and improvement or editing processes undertaken as part of the firm's quality-management program (see definitions that follow). At a minimum, the reviewer should address and review requirements identified within these guidelines. The project design team should not present documentation for a quality-assurance review that falls significantly below the requirements of these guidelines. In other words, the guidelines should be used to assist teams in completing minimum requirements established herein.

Quality management can be considered to have three main components: quality control, quality assurance, and quality improvement. Quality management is focused on not only product/service quality, but also the means to achieve it.[3]

1. *Quality Control* * is the ongoing effort to maintain the integrity of a process to maintain the reliability of achieving an outcome.
2. *Quality Assurance** is the planned or systematic action(s) necessary to provide enough confidence that a product or service will satisfy the given requirements.
3. *Quality Improvement* can be distinguished from Quality Control in that Quality Improvement is the purposeful change of a process to improve the reliability of achieving an outcome.

   *Note that *quality control* and *quality assurance* are sometimes used interchangeably in the design industries to define specific actions associated with improving outcomes.

One of the most significant challenges in conducting design-related quality management is the cost:[4]

Approximately 20 percent of design budgets are expended for reviews and corrections conducted after the design documents have been completed. Adding interim reviews and corrections to the cost, an average design project can easily require 30 percent to 50 percent of its budget to locate and correct errors.

Attempts to impose even more stringent quality-control methods to reduce design errors have resulted in a spiral of ever-increasing design costs. As clients become increasingly resistant to higher costs and increasingly demanding of higher quality, design firms are caught in a squeeze that forces them to sacrifice quality, design cost, or both. These sacrifices result in lost profits or lost clients, or both.

[3] Rose, Kenneth H. "Quality Management." Wikipedia. December 1, 2014. http://en.wikipedia.org/wiki/Quality_management.

[4] Stasiowski, Frank and David Burstein. Total Quality Project Management for the Design Firm: How to Improve Quality, Increase Sales, and Reduce Costs. Hoboken, NJ: John Wiley and Sons, Inc., 1994.

A primary thesis of this book suggests that quality management is most effectively and most efficiently applied as an integral, ongoing and well-defined component of the design and documentation process (often referred to as plan check). That approach is distinguished from tail-end and independent processes. The thesis suggests an alignment of principles and performance measures early in the process, as well as a series of inclusive and transparent design reviews and quality-control work sessions from Schematic Design through Construction Administration.

The timing and schedule for quality assurance reviews will vary for each project, depending upon the project's scope and scale. These reviews should be scheduled and budgeted at the project outset to occur at intervals appropriate to the project size and complexity. Reviews should occur at the very least once during each of the Concept Design, Schematic Design, and Design Development phases and twice during Construction Documentation.

High-Quality Built Projects

A project will rarely be constructed well if it is poorly documented. Poorly defined plans and details are not likely to be improved in the field through the contractor coordination process and may result in quality compromises and cost increases to both the client and contractor. The best executed projects are usually most well resolved in the design and documentation process.

Reduced Liability

By utilizing guidelines that improve the quality of project execution, a project will perform better from durability, safety, and user perspectives. In addition, the rate of errors and omissions will be reduced. As a result, the typical firm's liability will likely be reduced.

HOW TO USE THE BOOK

Potential Applications

Potential uses for the book have been defined as a set of tasks or objectives. For each of these objectives, a brief approach is highlighted.

Organizing a Complete Set of Landscape Architecture Documents

The skills required to organize and prepare a well-resolved landscape architecture project result from years of focused professional practice and

deeply engaged involvement with dozens of projects at various scales. Experience generally begets competency but does not ensure superior results.

For those without adequate experience to organize landscape architectural documents independently, these guidelines can serve as a useful tool. It is recommended that the landscape architect first refer to Chapter Two, *Documentation Principles* from *Section One: Establishing the Foundation.* Here, key organizing ideas are promoted. The landscape architect may then refer to *Section Two: Phases Overview,* where a comprehensive description of each potential component of the process is provided by design phase. To determine design process and documentation needs, the landscape architect should combine working knowledge of project circumstances with the project's potential to be comprehensively successful.

Preparing a Project Work Scope and Associated Fee

While every project is unique, and as such requires a custom approach, all projects deserve the initial consideration of a comprehensive design and documentation process. Comprehensive refers to a process that examines all potential considerations and results in a set of documents that represent the full breadth of the landscape architect's role.

In order to prepare a project work scope and fee, the landscape architect should first establish a design process that suits the needs of the project. That process can be outlined initially by drawing from the fully defined design steps itemized within this document, initially found in *Section Two: Phases Overview.* That process may include, for example, initial components such as a site investigation, user interviews, and a code review. These components should be itemized in the project work scope as tasks and deliverables.

Once tasks and deliverables are defined, the landscape architect can explicitly envision the documentation requirements for each phase of the project. Completed on a sheet-by-sheet basis that is known as a *Document Set Mock-Up.* The mock-up set reflects the likely number of plan sheets, based upon decisions regarding plan scale and sheet layout. Some non-plan sheets, such as those that contain details, can be projected based upon assumptions from similar, recently completed work. The mock-up set can be represented graphically or in outline format. It is important to understand the full number and types of sheets that will be prepared, as they have cost implications.

The *Document Set Mock-Up* can then be used to estimate fees required to conduct the landscape architecture work. Some firms may keep historic data on costs to complete project design and documentation. These data can be categorized by project type, level of complexity and other criteria. Cost data should reflect actual fees expended, rather than contractual fees. These fees can be tabulated to reflect costs necessary to complete each sheet within the set by phase. For example, if $322,000 was expended to complete a Design Development set with 28 sheets, that roughly equates to $11,500 per sheet. The per-sheet cost reflects all tasks and activities that precede and ultimately result in the sheet outcome itself, for example, meetings, design analysis and study, coordination, and quality management.

Preparing a work scope fee by analyzing and quantifying the number of sheets in a set is only one of a number of approaches to preparing project fees. Other approaches include Time and Task, Schedule and Manpower, and Fee as a Percentage of Construction. It is recommended that the landscape architect utilize several approaches to examining fees, in order to cross-check assumptions and outcomes.

Establishing Content for Individual Documents

As the primary emphasis of this publication, these guidelines are both comprehensive and explicitly rich with recommended content for each component within landscape architectural design and Construction Documents.

It is especially important that the landscape architect understand content distinctions between associated DD and CD sheets. The relationship between DD and CD content varies by sheet series and is strategically determined. That is to say, more information is not typically better at the DD level. For example, the DD Site Grading Plan and the Site Layout Plan are cautiously developed at a framework level, while the DD Site Materials Plan and the Site Demolition Plan are more thoroughly advanced. The logic of these specific strategies is described within the guidelines for each sheet.

Sheet-by-sheet content information can be found within *Section Three: Guidelines and Best Practices.* DD- and CD-level sheet series are paired within the guidelines for ease of comparison. As the landscape architect sets out to establish a Design Development sheet, he should first understand the stated *objective and general requirements* for the sheet. The project team must agree to these requirements in order to support and follow the logic of the recommended specific requirements. *Specific requirements* are organized in a checklist format and in general order of sequenced application.

Establishing Graphics for Individual Documents

Each drawing within the design and documentation process is devised with a unique purpose. Accordingly, graphic strategies vary from drawing to drawing and from phase to phase. Within these guidelines each drawing or sheet is defined with detailed graphic requirements. Consistent graphic requirements throughout the documents are also defined.

For example, a landscape architect interested to know how to graphically distinguish a DD Site Layout Plan from a DD Site Materials Plan should refer to representative graphic examples and associated graphic checklist requirements for each of these two documents. This information can be found within *Section Three: Guidelines and Best Practices.*

Conducting Design Reviews

In many firms, design reviews embody the heart of the design studio, where pin-ups and critiques of design proposals represent the essential exercise in advancing design. A number of resources within this book may be useful in conducting effective design reviews.

Essentially, the key implications and outcomes of the design and documentation process should be evident and verbalized in design review forums. Missing or underdeveloped process elements may result in weaknesses in the design. Working knowledge of these elements may help one to facilitate an effective design review. For example, during an SD or even DD design review someone might ask questions such as, "Have performance objectives been defined and documented?" Or, "Can three-dimensional clarity be given to an element?" Perhaps a juror may suggest that the interdisciplinary relationships should be better coordinated or that scale relationships between elements deserve study.

Conducting Quality Assurance Reviews

Quality Assurance reviews are completed by experienced staff in an effort to control or improve the quality of the documents. These reviews are extremely important to built outcomes and require methodical and disciplined processes. A number of elements within this book will be useful resources for this process:

- Content Requirements by Phase, in *Section Two: Phases Overview*
- Sheet Requirements, in Section Three: *Guidelines and Best Practices*
- Interdisciplinary Coordination Requirements, in *Section Three: Guidelines and Best Practices,* for each sheet, for example, Design Development Grading Plan, Best Practices, Coordination

The quality assurance reviewer should participate in the design and documentation process from the outset so she can evaluate the intended content of the documentation sets. As the content of the DD and CD documents matures, the reviewer may utilize the requirements included within this publication in order to check conformance to the guidelines.

Conducting Interdisciplinary Coordination

The Role of Quality Management

The implementation of a firm or office Quality Leader is recommended as the primary resource for execution of these guidelines. This person should maintain a detailed understanding of the requirements, stay abreast of the industry's best practices, and report potential improvements to their firm's individual documentation guidelines. The Quality Leader should also be responsible for orienting new employees to the guidelines, providing frequent refresher seminars and ensuring that guidelines are being implemented on all projects.

An initial design and documentation training program should be comprehensive and widespread, with the intent to align all design staff to a common set of practice guidelines. In firms with multiple offices, unique or disparate practices by each office will not allow the firm to operate effectively in completing projects. Regular training allows all design staff to overcome disparate and inconsistent practices and engage themselves in the firm's practices guidelines through a shared learning experience. Design and documentation practices are normally one component of a larger project delivery system within the design firm. Relationships between these practices must be well coordinated.

Literature Review—Defining the Need

The current publication is intended to focus on the all-encompassing role of documentation in the landscape architectural design and Construction Documentation process. Documentation refers to those drawings, images, models and narrative produced and organized sequentially to convey design intent and construction requirements.

Across the industry, a wide-ranging literature base highlights the breadth of the profession. Topics range from design theory and process to countless technical references and built work portfolios. There are, however, a very limited number of resources that focus strictly on documentation practices for landscape architecture.

A range of standards, guidelines and practice-oriented books have been developed for landscape architectural design and construction. Some of these publications are comprehensive and wide ranging, covering a series of topics of interest to the landscape architect. Others are more specialized, focused on a single topic, such as site construction detailing. Some speak to a limited extent regarding documentation issues.

2 DOCUMENTATION PRINCIPLES

Landscape Architectural Design and Construction Documentation
The most meaningful design processes follow a set of principles that establish basic assumptions and beliefs to guide decision making. Landscape architectural documentation practices can achieve similar clarity with the use of principles. Principles help to keep complex processes aligned to core attitudes and philosophies. Principles are applied to the landscape architectural documentation process to illuminate key rules associated with this complex practice. An overview of broad *organizational principles* is provided first: these establish the core values that should be understood theoretically. A set of specific *operational principles* follow: these are used to guide the tangible preparation of landscape architectural documentation.

ORGANIZATIONAL PRINCIPLES

Design and Documentation Synergies

"Synergy" generally refers to two or more entities working together to create the greatest shared outcome. Design and documentation are not independent activities but rather practices that depend upon one another for mutual benefit. Documentation should be used as a design study tool and as part of a process of exploration, evaluation, and discovery. In this way, design benefits from thorough, wide-ranging documentation processes. Conversely, documentation quality is enhanced with rigorous interdisciplinary design processes. When designers work closely together, the results of that collaboration are usually evident in the quality of documentation.

Design documentation represents a core and integral constituent of the design process. There is negligible design exclusive of physical documentation. While design is inherently a critical-thinking process, that thinking must be displayed in drawings and words in order to be evaluated and further developed. The nature and quality of the documentation media has great impact on the design outcome; the two areas, design and documentation, coexist as a synergy. While effective documentation does not ensure superior design, it nearly guarantees that the design will be well resolved. A well-resolved design is comprehensively studied, understood, and documented.

Much has been written about drawing and documentation as a means to design reasoning. In "Drawing [Documenting] as a Means to Design Reasoning" Ellen Yi-Luen Do and Mark D. Gross examine relationships between "various activities of designing, drawing and interpreting."[1]

> There seems to be agreement that drawing plays an important role in supporting design reasoning. However, little work to date has examined this connection in close detail. It may turn out to be difficult. On the one hand, design seems to employ a range of quite different reasoning activities, and on the other hand, designers employ a range of quite different drawing acts. Nevertheless, the time may be ripe to develop a mapping between design reasoning and the drawing acts that designers use to carry them out.
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> The authors "look at various activities of designing, drawing and interpreting." The authors do "not mean to suggest that the items listed . . . are exhaustive or exclusive, or even necessarily exactly the right categories. And, it may turn out that despite our facile categorization, the acts of drawing, interpreting, and design are not so easily separable. Eventually we would like to understand the relations between these activities, showing how the lower-level activities of drawing and interpreting serve the activities of design, and how the goals of design might direct the drawing and interpreting activities.

The investigation specifically suggests that design documentation is commonly used to depict comparable references, establish analogies and abstractions, refine and evaluate proposals, and interpret all these drawings via cognitive processes.[2] Relationships between documentation and design reasoning are explored as a set of synergies, as highlighted here.

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[1] Do, Ellen Yi-Luen and Mark D. Gross. "*Drawing as a Means to Design Reasoning.*" Paper presented at Artificial Intelligence in Design '96 Workshop on Visual Representation, Reasoning and Interaction in Design, Palo Alto, CA, 1996.

[2] Yi-Luen Do, Ellen, and Mark D. Gross. "Drawing as a Means to Design Reasoning." *Artificial Intelligence in Design '96 Workshop on Visual Representation, Reasoning and Interaction in Design,* 1996. http://code.arc.cmu.edu/dmgftp/publications/pdfs/aid96-mdg.pdf.

- **Finding References:** By sketching or otherwise representing historic design precedent, an expedited and immediate discussion is enabled. As an immersive exercise, issues are brought to light and problem statements are potentially refined. References are not sought for imitation purposes.
- **Analogy:** Visual analogies are distinguished from verbal analogies in the act of interpreting and applying the analogy to project conditions. That process is used to test the analogy and determine its suitability. As analogies are used to transfer thought and meaning from one subject to another, they can be used to shift perspective or problem definition.
- **Abstraction:** Rather than focus on tangible or concrete depictions initially, the designer may expedite and broaden the exploratory basis of the proposal by representing ideas with intentionally vague or ambiguous expression. Simplification is often part of this strategy.
- **Refinement:** Abstract notions are made specific through the process of drawing and redrawing, often at increasingly larger scale, and with additional detail. Interdisciplinary engagement is helpful at this stage, as relationships and potential synergies are explored.
- **Evaluation:** Drawing and documentation are fundamental to design evaluation, the venue for assessment of performance intent, both intuitive and quantitative.

These activities reinforce the role of drawing and documentation as a design discovery tool, as a means of refreshing perspective on a project.

The majority of drawing-design exploration takes place in the early stages of the process, where significant leaps, advances, and adjustments in the design proposal are made. These advancements rely, in part, upon the role of design documentation in defining analytical and formative intentions.

Most flexibility in the design and documentation process is encouraged during Schematic Design. Here, inventive and resourceful approaches to representing and analyzing design are encouraged. The unconstrained search for ideas and the broad investigation of issues should not be tempered with uniform protocols or conventions.

That does not suggest, however that key components of the design and documentation process are dispensable. While processes vary from firm to firm, the quality of the outcomes that follow varies, too. The most comprehensively successful outcomes seem to rely upon the overt communication of design logic (reasoning) and evaluation criteria. When this content is not formally documented, it is of uncertain impact.

For example, if principles are not documented, do they exist? Or, can a Schematic Design proposal be properly evaluated without reference to well-documented and measurable objectives? Does Design Development serve its purpose without drawings that resolve interdisciplinary relationships and coordination needs? Unsatisfactory answers to these questions reinforce the need for integral relationships between design and documentation processes. The importance of these relationships suggests a need to strategically define the documentation components themselves, in order to maximize their influence on the design outcome.

Relationships between Documentation Quality and Implementation Quality

If design and documentation processes present synergistic relationships, documentation and implementation quality are strictly interdependent. A well-documented project is much more likely to be well built than a poorly documented project.

In a traditional design-bid process, a well-conceived but poorly documented design proposal is unlikely to be well built. That is not to say that a talented designer working with an accomplished craftsman cannot complete well-executed work. That (latter) scenario would likely result from the craftsman having reason to transform a vague or sketchy idea into highly resolved construction. The competitive bidding environment, however, provides little incentive for such a process. Generally speaking, a contractor will build what the client has contracted or, in other words, what the contractor bid on. In that case, the built outcome will be executed only as well as the quality of the documents presented in the bid. Furthermore, poorly completed documents often result in construction cost overruns and schedule delays.

Accordingly, a number of intrinsic relationships are difficult to overcome:

Poor Design + Poor Documentation = Poorly Executed Work

Good Design + Poor Documentation = Poorly Executed Work

Poor Design + Good Documentation = Poorly Executed Work

Good Design + Good Documentation = Well-Executed Work

Design quality and documentation quality are judged separately and by different criteria. Design firms differ in how they judge design quality. It is often evaluated by project-specific criteria. Aesthetics, environmental performance, social or user function, and even financial performance are used variously by firms and clients to judge good design.

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