

CSI's GUIDING TECHNICAL PRINCIPLES

Revised per MasterFormat 04, NCS 3.1 & the Project Resource Manual, 5th Edition
March 2005

Preface: *CSI's Guiding Technical Principles (Guide)* is intended for use by CSI committees, task teams, and potential writers in developing technical publications. It may also be used as a guide for CSI Chapters and Regions in conducting their technical programs and activities. In addition, it can be used to inform speakers, product exhibitors, and the rest of the construction community of CSI's guiding technical principles.

In developing the *Guide*, CSI's Technical Committee attempted to achieve a balance between producing an easily portable quick reference guide while maintaining its usefulness without requiring the user to constantly refer to the technical source documents (*The Project Resource Manual- CSI Manual of Practice*, Format documents, *U.S. National CAD Standard*, etc.). Depending on the particular technical endeavor, an initial review of the technical source documents will be required. Many of the guiding technical principles in the *Guide* contain a reference to the technical source material that amplifies the principle. The intent is that the user need carry few, if any, of the source documents when speaking, producing technical documents, or representing CSI.

Besides containing statements of CSI technical principles, the *Guide* includes some basic principles about how documents should be developed, e.g., by consensus. The *Guide* currently relies on CSI's Strategic Plan as the primary source for principles of document development.

The Technical Committee envisions the maintenance of the *Guide* as an integral part of its acceptance and usefulness. The *Guide* has been updated based upon *MasterFormat*TM '04, NCS 3.1, and *The Project Resource Manual - CSI Manual of Practice*.

In the future, the Technical Committee may also re-evaluate the *Guide* between printings of the various source documents and update the *Guide* as needed to reflect changes due to new or major revisions to the technical source documents that CSI has published, adopted, or endorsed.

Preamble: This guide is incorporated by reference into CSI's "Procedural Guide for Representing CSI." The primary technical source documents from which these guiding technical principles are extracted are:

- *The Project Resource Manual - CSI Manual of Practice* [2004 edition] (PRM)
- CSI/CSC Format Documents
 - *UniFormat*TM [1998 edition]
 - *MasterFormat*TM [2004 edition]
 - *SectionFormat*TM [1997 edition]
 - *PageFormat*TM [1999 edition]
- *U.S. National CAD Standard* [Version 3.1] – (NCS)

CSI/CSC FORMATS

The various formats developed by CSI and allied organizations are for the purpose of providing consistent structure and location of information throughout the A/E/C industry.

MasterFormat: Use: In accordance with *MasterFormat* Application Guide

- Only accepted organizational structure for specifying using prescriptive (descriptive, proprietary, and reference standard) based construction specifications.
- An organizational structure for performance based construction specifications and construction specifications that combine both the prescriptive and performance modes of specifying.
- An organizational structure for procurement specifying.
- An organizational structure for detailed cost analysis.

UniFormat: Use: In accordance with the *UniFormat* Application Guide (*UniFormat* page 9 - 18)

- An accepted classification system for Construction Systems and Assemblies, cost models, facility management based upon “function” (e.g., foundations provide the function to stabilize and support).
- An accepted organizational system for preliminary project descriptions, performance based construction specifications and project manuals when design-build project delivery is employed.
- In conjunction with the *Uniform Drawing System* of the *U.S. National CAD Standard*, an accepted method of filing drawings

SectionFormat: Conformance with 3-part format for writing construction specifications (General, Products, Execution).

- PART 1 General: Listing of administrative and procedural requirements specific to the section.
- PART 2 Products: Listing of requirements for products, and fabrication prior to incorporation into a project.
- PART 3 Execution: Listing of requirements for on-site work activity. Includes schedules.

Rather than grouping administrative, product requirements and execution requirements under each product separately, *SectionFormat* provides a uniform approach to organizing specification text within each section. *SectionFormat* is based upon the principle that a section should be organized by grouping the administrative requirements, product requirements, and execution requirements for each product together.

PageFormat: Conformance with and use of levels and alignment (Figure PF-1).

1.01 ARTICLE [Heading with no specified requirements]	(1 st Level)
A. Paragraph [Specified requirement, or heading if followed by subparagraphs]	(2 nd Level)
1. Subparagraph [“]	(3 rd Level)
a. Subparagraph [“]	(4 th Level)
1) Subparagraph [“]	(5 th Level)

Lower Level requirements apply to higher level requirements.
 Avoid excessive use of sub-levels beyond Level 3.
 Avoid placing excessive requirements on any level.

PROJECT MANUAL CONCEPT AND ORGANIZATION (Ref. Figure PRM 5.9-A)

Project Manuals should be assembled in the following order:

- Introductory Information:** Project Title Page, Certifications Page, Seals Page, Table of Contents, List of Drawing Sheets, and List of Schedules
- Procurement Requirements:** Solicitation, Instructions for Procurement, Available Information, Procurement Forms, and Supplements.
- Contracting Requirements:** Contracting Forms and Supplements (Notice of Award, Agreement Forms) Project Forms (Bond Forms, Certificates and Other Forms, Clarification & Modification Forms, and Closeout Forms) Conditions of the Contract (Contracting Definitions, General Conditions, and Supplementary Conditions).
- Specifications:** Divisions and Sections as outlined in *MasterFormat*.

SPECIFICATIONS AND OTHER CONTRACT REQUIREMENTS SHOULD BE TAILORED TO THE PROJECT - clear, concise, correct, and complete – (*The Project Resource Manual - CSI Manual of Practice 5.8*)

Specifications for use in construction should include only requirements applicable to the work specified for a specific project. Extraneous information should be deleted.

Specification Detail: Specification detail should be commensurate with the project, and project delivery method. Specifications for a large housing project will be more complex than those for a small vacation cottage, but the same general rules for clarity and conciseness apply to both projects. Degree of detail is a matter of judgment, and is often tempered by economic considerations. A specification is complete when it covers all, important details without elaborate or unnecessary language. [PRM 5.8.12]

Location of Subject Matter:

- Specific requirements should be stated once and in the properly designated location as established by the CSI/CSC Formats (*MasterFormat, UniFormat, SectionFormat, PageFormat*).
- Procurement requirements (formerly bidding requirements), contracting requirements (formerly contract forms, & conditions of the contract), Division 01 requirements should be in accordance with the MasterFormat and Uniform Location of Subject Matter document No. 1910-16 as published by the EJCDC and endorsed by CSI.
- Requirements pertaining to an individualized portion of the work may be described in multiple locations as requirements become more progressively detailed (i.e., requirement stated in General Conditions, elaborated upon in Division 01, and further elaborated upon in subsequent specification Divisions)

Method of Specifying: Any or a combination of the four specifying methods (Performance, Descriptive, Proprietary, Reference Standard) may be used to specify requirements throughout a project manual. However, combining methods of specifying for a single product can create redundancy or contradiction. [PRM 5.7]

TERMS AND DEFINITIONS

Terminology Concepts: Terms and definitions should be used in a consistent manner. Consistent use of Terminology shall be as contained in the current edition of the *PRM – The Project Resource Manual - CSI's Manual of Practice*, including appendix formats, the *U.S. National CAD Standard*, and the standard General Conditions published by the American Institute of Architects (AIA) and the Engineers Joint Contract Documents Committee (EJCDC).

Terms used on Drawings should follow terminology used in the Project Manual. Terminology in the Project Manual should follow terminology accepted within each manufacturing industry segment.

Built Environment: a concept encompassing all constructed entities and spaces created or modified by human intervention in the natural environment.

Facility Life Cycle: the various “stages” of a project leading to a completed facility, its use and management until its eventual modification, deconstruction, demolition, or adaptive reuse. These “stages” are Project Conception, Project Delivery, Design, Construction Documentation, Bidding/Negotiation/and Purchasing (together known as procurement), Construction, and Facility Management. [CSI PRM 1.5]

Project: the “process” of planning, design, documentation, contracting, construction, and management that results in a facility. [CSI PRM 1.1]

Project Delivery Project delivery moves a project from concept to a completed facility. Project Delivery methods include: [CSI PRM 3.1]

Design-Bid-Build

Design-Negotiate-Build

Construction Management: Both “as advisor or agent” (CMA) and “as contractor” (CMc)

Design-Build

Owner-Build

Fast track and multi-prime contracts are not included as project delivery methods, but are considered techniques of scheduling and procurement, respectively.

Construction: the execution of the work required by the contract documents. This involves construction project management and construction contract administration. [CSI PRM Module 7 - Construction]

Substantial Completion: the term used in most standard conditions of the contract to indicate that the project, work, or designated portion is complete to the extent that it may be utilized for the purpose intended. [PRM 7.11.14; 7.12.3.7; 8.2.5]

Facility Management: the process of allocating resources for the operation and maintenance of a facility to allow the continued performance of the facility’s intended function [PRM 8.1]

Construction Documents: the written, graphic, and multi-media documentation of requirements for constructing and administering the construction contract. Construction documents should be tailored for types of project delivery and techniques of specifying. Each requirement should be stated only once and in the correct location. Information in one document should not be repeated in other documents. [CSI PRM Module 5 – Construction Documents]

Bidding/ Negotiating/Purchasing Stage: is collectively known as procurement. Variations in the process are affected by whether the owner is public or private, different project delivery methods, and whether the scope includes construction or purchase of goods. [CSI PRM Module 5 – Bidding/Negotiating/Purchasing]

Construction Drawings: Drawings are graphic and textual information organized on a two-dimensional surface for the purpose of conveying data about a specific portion of a project. [UDS Intro. 15 and PRM 5.10.1]

Project Manual: The written construction documents prepared for procuring a construction contract and for constructing a facility. [Ref. *PageFormat* PF.4] Terms used to describe elements of project manual should be in accordance with the *Project Resource Manual - CSI Manual of Practice* [PRM 5.9]

Specifications define the requirements for products, materials, and workmanship upon which the contract is based and requirements for administration and performance of the project. They are written for each subject as sections and organized by Divisions 01-49 under *MasterFormat*, or by categories under CSI’s *UniFormat*. [PRM 5.1.4.4]

Specification Section: refers to a subdivision of a Division. A Section is divided into Parts; each Part having Articles, Paragraphs, and sub-paragraphs that should be as defined in the *PageFormat*. [Ref. *PageFormat* PF.4]

“**Allowances,**” “**Alternates,**” and “**Unit Prices**” should be defined in accordance with *The Project Resource Manual - CSI Manual of Practice*. [Ref. PRM 4.6, 5.7]

“**Proprietary,**” “**Reference Standard,**” “**Descriptive,**” and “**Performance**” (terms used to describe the methods of specifying) should be in accordance with *The Project Resource Manual - CSI Manual of Practice* [Ref. PRM-MOP 5.7].

“Quality,” “Quality Control,” and “Quality Assurance,” their usage and concept, shall be in accordance with those concepts as set forth in *The Project Resource Manual - CSI Manual of Practice* [Ref. PRM 3.3, 4.5, 5.9.8 and 7.7 SectionFormat and MasterFormat].

FUNCTION AND INTER-RELATIONSHIP OF DRAWINGS AND SPECIFICATIONS

Contract Drawings and Specifications are part of a set of Construction Documents prepared by a design professional for communicating the work to be performed and administering the contract for its execution.

Contract Drawings and Specifications are complementary to one another; and information contained in one should not duplicate information in the other. [PRM 5.10.2.3] The use of statements in the project manual to establish the precedence of the various contract documents is not recommended because the documents are complimentary [PRM 5.11.4.4].

Drawings show relationships between elements and may show the following for various materials and assemblies [PRM 5.10.1]:

- Location
- Identification
- Dimension and Size
- Details and diagrams of connections
- Shape and form

Except in the absence of a separately bound Project Manual, drawings should not define the quality of materials, and installation requirements for products and materials, or include administrative requirements upon which a contract is based.

Specifications define the qualitative requirements for products, materials, and workmanship, and the administrative requirements upon which a contract is based. [PRM 5.5] Contract specifications are a description of the work to be performed by the contractor and are prepared by the A/E. [PRM 7.1.3.3] Specifications are typically written documents, but may also include other types of media (i.e., audio/visual representations of Contract requirements) and are included within a Project Manual. Contract Specifications do not include Procurement Requirements and Contracting Requirements - documents that are also included in a Project Manual.

Construction drawings should be produced and maintained in accordance with the *U.S. National CAD Standard* (See the *U. S. National CAD Standard* portion of this *Guide*). Construction Specifications should be produced in accordance with *The Project Resource Manual - CSI Manual of Practice*, including appendixes.

SPECIFICATION LANGUAGE [Ref PRM 5.8]

Use simple declarative sentences.

Use well known technical or construction industry terms whenever possible. Avoid construction slang (i.e., “drywall”)

Avoid abbreviations.

Use streamlined sentences

- Use imperative mood of sentence construction. (i.e., place verb or action required before noun or subject).
- Use modifiers instead of prepositional phrases (i.e., state “platform top”, instead of “top of platform”)

CONDITIONS OF THE CONTRACT [Ref. PRM 5.4]

Use of Standardized General Conditions: The use of *The Project Resource Manual - CSI Manual of Practice* referenced general conditions, or general conditions that have adopted the same basic division of responsibility among the design, constructor, and owner teams during the construction process, is recommended.

The Contracting Requirements should include, and be limited to the basic rights, responsibilities, and relationships of the entities involved in the performance of the contract. More detailed requirements pertaining to the administration of the Contract should be located within Division 01.

THE DIVISION 01 CONCEPT [Ref. Figures 5.6-A and 5.6-D contained in PRM 5.6]**Administrative and procedural requirements:**

Division 01 specifies the general administrative and procedural requirements that are common to the administrative and procedural requirements specified within all subsequent specification sections. Division 01 sections expand upon the broad provisions stated in the conditions of the contract regarding the basic rights and responsibilities of the contracting parties and their representatives.

Division 01 is essential to streamlining and establishing the quality control and assurance provisions of the work results described in a construction contract

Temporary Facilities and Controls:

Division 01 specifies temporary facilities and controls for a construction contract that are put into place for use only during the period of construction, and that will be removed when no longer required for construction operations.

General Performance and Life Cycle Activities

Division 01 may also be used to specify or categorize general facility performance and life cycle activities

U.S. NATIONAL CAD STANDARD:

Drawings intended for use in the United States should comply with this standard.

- Organize drawings in accordance with UDS-01 of the U.S. National CAD Standard
- Assign discipline designators in accordance with UDS-01, Appendix A of the U.S. National CAD Standard
- Use drawing terms and abbreviations in accordance with UDS-05 of the U.S. National CAD Standard
- Use drawing symbols in accordance with UDS-06 of the U.S. National CAD Standard

PRODUCT REPRESENTATION:

Product binders should contain information necessary to perform the following tasks:

- Evaluate the product and select product options
- Incorporate the product into a design
- Draw, detail, specify and order the product
- Understand installation and maintenance requirements
- Identify the manufacturer and local product representative

CONSTRUCTION ADMINISTRATION: [Ref. PRM Module 7]

- Construction Administration is based upon the project delivery method and the roles and responsibilities included in the Agreements and Contract Documents.
- Construction Administration requires an understanding of the Contract Documents, and may involve one or more of the following: representing the owner, observing the work, certifying or recommending payments, interpreting Contract Documents, resolving disputes, modifying Contract Documents, reviewing submittals, site visits, observation, and inspection.

STEWARDSHIP OF THE ENVIRONMENT:

- Environmental claims should be based upon Life Cycle assessment unless otherwise clearly distinguished.
- Environmental requirements should be mainstreamed and interwoven into the construction process and documentation whenever possible.

DEVELOPMENT OF CSI TECHNICAL DOCUMENTS:

Balanced Development: CSI shall not develop or promote documents that favor one segment of the Industry.

Solicitation of Commentary: Means shall be developed to solicit input from a broad assortment of participants within the construction community. Each Task Team/Liaison/Committee shall develop a written policy for acknowledging contribution and commentary from sources outside the primary document development team.

Standardization: CSI technical documents shall promote standardized formats for organizing construction activity.

CSI's Mission: Documents developed by CSI should advance the process for creating and sustaining the built environment [CSI Strategic plan, June 2004] by addressing all segments of the built environment.