

USE OF CSI FORMAT FOR PREPARING SPECIFICATIONS

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I. INTRODUCTION

Recently, Chen completed a project for the Office of Surface Mining, Reclamation and Enforcement (OSM), for which an existing set of grouting specifications was adapted into three separate sets of specifications using the CSI Format. As a part of this contract, a seminar on the use of the CSI Format was held for OSM and the State of Kansas AML Program. This seminar was held at the Denver office and was conducted by a member of the CSI who is a consultant in the preparation of specifications. Our specifications were critiqued by this consultant, put into final form and submitted to the OSM for their use in AML construction projects.

II. BACKGROUND

The Construction Specification Institute was founded in 1961 for the purpose of "Improving Specification Practices in Construction and Allied Industries". The CSI published its first "Manual of Practice" in 1967. Since that time, the CSI has worked closely with its Canadian counterpart, the CSC, to develop an internationally recognized standard format for writing specifications.

The CSI Format has been adopted and endorsed by such professional organizations as the NSPE, ASCE, ACEC and the AIA. The format is now being used by the Departments of Defense and Interior and there is increased use by industry. Construction reference books are now being prepared in CSI Format for easy retrieval of information.

The philosophy of CSI is to establish a standard location for specific information and to state that information once in the correct location and only in that location.

The "Manual of Practice" for CSI provides an outline of recommended techniques as a philosophy for preparing and organizing written construction documents. It does not contain the technical, product or

design information needed to develop and prepare project specifications and is not intended to be a complete textbook on project manual preparation.

III. 16 DIVISION FORMAT

One of the fundamental questions in specification writing is how to organize the specifications. The CSI has developed a 16 Division Format for this purpose.

The 16 Division Format establishes broad categories of construction information so that specification sections of a similar nature can be grouped together. The 16 divisions have gained acceptance as an industry standard in the United States and Canada.

The 16 divisions are fixed in both number and title. The 16 Division Format does not necessarily follow the sequence of construction. However, it does follow a procedure that is logical and the groupings lend themselves to convenient subdivision.

The 16 Division Format has the following advantages:

- . Provides a standard, fixed framework for organizing specifications.
- . Serves as a sequencing guide for arranging specification sections.
- . Provides easy retrieval of information.

IV. MASTERFORMAT

Another part of the CSI Format is the Section Format or Masterformat. The three main uses of the Masterformat are to organize specifications, file construction data and to arrange cost estimates.

The Masterformat expands the 16 Division Format by providing names and numbers for various specification sections. It provides names for almost all conceivable specification sections in a recommended sequence for each division.

Each section is given a five digit number. The first two digits refer to one of the 16 divisions.

There are three levels of complexity for section scopes. These are:

- . Broadscope
- . Mediumscope
- . Narrowscope

A broadscope title is a very general and encompassing category. Example: 02200 - EARTHWORK.

A mediumscope specification section covers a unit of work of a more limited scope. Example: 02210 - GRADING.

Finally, there are the extremely limited narrowscope titles, each covering very specific types of information. Example: 02212 - FINISH GRADING.

A section does not necessarily relate to the work performed by a single Subcontractor; therefore, the text of sections and the specifications are always addressed to the Contractor and not the Subcontractors. Responsibility for the total project remains with the Contractor no matter how the work is divided among Subcontractors.

Five digit numbers are provided in Masterformat for all broadscope and mediumscope sections. Narrowscope sections are unnumbered in Masterformat so users may select only those narrowscope titles needed for a particular project.

When writing specifications, not all sections need to be broadscope, nor do all sections need to be mediumslope or narrowscope, there can be a mix. Simple projects will contain many broadscopes and, as the complexity of the project increases, specifications may require the use of more mediumslope and narrowscope sections.

As a general rule, the use of many narrowscopes should be limited to very large and complex projects.

V. 3-PART SECTION FORMAT

Masterformat standardizes the arrangement and naming of specification sections within a project manual. There is also a need to standardize the way in which information is presented within the individual sections. The 3-Part Section Format groups information into three distinct categories or parts. These three parts are:

- . Part 1 - General
- . Part 2 - Products
- . Part 3 - Execution

These three parts are fixed in name and order. This is another way of standardizing specification writing.

Part 1, General - Defines the specific administrative and procedural requirements unique to this section.

Part 2, Products - Describes, in detail, the quality of items that are required for incorporation into the project under this section.

Part 3, Execution - Describes, in detail, preparatory actions and how the products are incorporated into the project.

Each part of a section is further divided into articles and paragraphs. All article titles are optional and should be carefully selected.

VI. METHODS OF SPECIFYING

There are four methods of specifying:

- . Descriptive
- . Performance
- . Reference Standard
- . Proprietary

Descriptive - Defines properties of materials and methods of installation without propriety information.

Performance - Specifies required results and criteria used to verify performance. The Contractor is free to find material complying with the performance criteria.

Reference Standard - Requires product or process to meet established standards.

Proprietary - Specifies brand names, model numbers and other proprietary information.

Nearly all project specifications employ more than one specifying method and, in some cases, all methods are used. There is no clear rule for using one method or a combination of methods. However, the specifier should avoid combining methods in the specification of a single product.

The majority of specifications for AML Project 12 are performance specifications with some descriptive and reference standard methods included for areas such as revegetation and radon covers.

VII. SPECIFICATION LANGUAGE

An important part of the CSI Format is specification language. CSI uses the statement, "It is essential that a specification be clear, correct, complete and concise." By this they mean:

- . Be Clear: Use correct grammar and avoid ambiguity. Use correct words to convey exact meanings.
- . Be Correct: Present specifications accurately and precisely.
- . Be Complete: Do not leave out important information.
- . Be Concise: Eliminate unnecessary words, but not at the expense of clarity, correctness or completeness.

Sentence structure is an important part of specification writing. Traditional specification language is in the indicative mood or passive voice. This requires the use of "shall" in nearly every statement.

This sentence structure can cause wordiness and monotony.

The CSI recommended sentence structure is in the imperative mood. In this structure, the verb which clearly defines the action becomes the first word in the sentence.

The imperative sentence is concise and readily understandable.

Good writing style promotes accuracy, brevity and clarity. Some simple rules for good style are:

- . Use short sentences.
- . Maintain simple declarative statements.

- . Avoid complicated sentences where in advertent omission or insertion of punctuation can change the intent or create ambiguity.
- . Choose words and terms that are clearly understood. Use the dictionary whenever necessary.

In addition to previously discussed organizational formats, the CSI provides a standard page format for organizing specifications.

VIII. DEVELOPMENT OF A MASTER SPECIFICATION

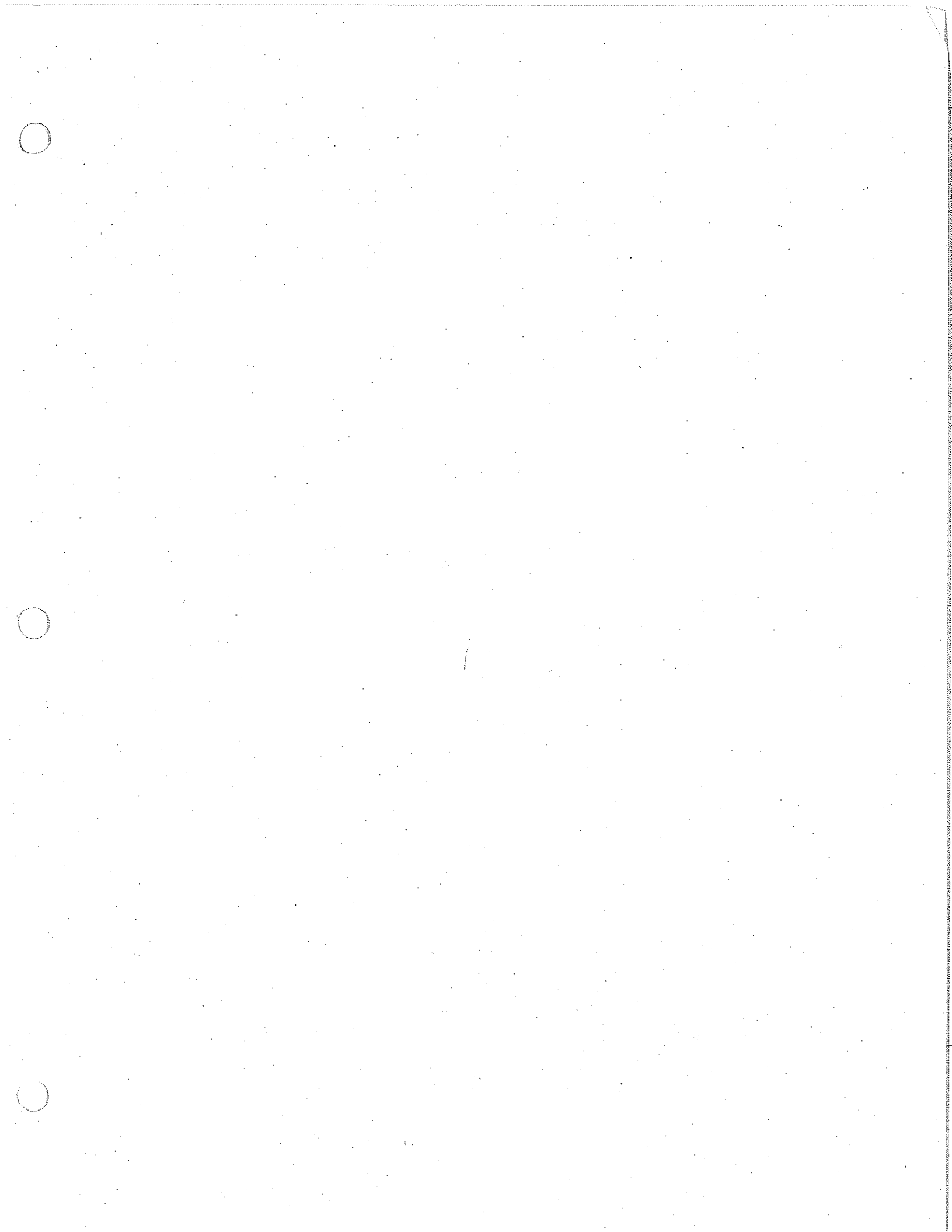
Recently, we have been converting the AML Project 12 specifications into the CSI Format for the purpose of developing a Master Specification. The Master Specification will reduce the need for producing completely new specifications for each new project.

The Master Specification will allow us to pull the needed specification sections from our file, make the appropriate changes and/or additions, and will reduce the cost of preparing specifications.

A well organized and thorough Master Specification will allow us to be more cost competitive and demonstrate a professional capability to clients. Its use will allow for a more efficient use of project budgets by making more monies available for the design phase or other areas of the project as needed.

The Construction Specifications Institute provides generic specifications called Spectext. Spectext provides general sections for use in preparing specifications for a particular item(s) of work.

Spectext differs from our Master Specification in that it is general and designed for use in various projects. The Master Specification is for a more specific, complete project.



UNIFORM LOCATION OF SUBJECT MATTER
INFORMATION IN CONSTRUCTION DOCUMENTS
PREPARED BY
ENGINEERS' JOINT CONTRACT DOCUMENTS COMMITTEE

AND
ISSUED AND PUBLISHED JOINTLY BY

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A PRACTICE DIVISION OF THE
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

CONSTRUCTION SPECIFICATIONS INSTITUTE

THE AMERICAN INSTITUTE OF ARCHITECTS

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ADVANTAGES OF 16 DIVISION FORMAT

- **PROVIDES A STANDARD, FIXED FRAMEWORK
FOR ORGANIZING SPECIFICATIONS**
- **SERVES AS A SEQUENCING GUIDE FOR
ARRANGING SPECIFICATION SECTIONS**
- **PROVIDES EASY RETRIEVAL OF INFORMATION**

MASTERFORMAT

- **BROADSCOPE SECTION TITLES**
- **MASTER LIST OF SECTION TITLES
AND NUMBERS**
- **BROADSCOPE SECTION EXPLANATIONS**
- **KEY WORD INDEX**

LEVELS OF SECTION SCOPES

- BROADSCOPE - VERY GENERAL AND ENCOMPASSING SCOPE OF WORK

02200 - EARTHWORK

- MEDIUMSCOPE - COVERS A MORE LIMITED AND DEFINED SCOPE OF WORK

02210 - GRADING

- NARROWSCOPE - DETAILS A VERY SPECIFIC TYPE OF WORK

02212 - FINISH GRADING

THREE-PART SECTION FORMAT

PART 1 - GENERAL

PART 2 - PRODUCTS

PART 3 - EXECUTION

SECTION FORMAT OUTLINE

PART 1-GENERAL

SUMMARY

SECTION INCLUDES
PRODUCTS FURNISHED BUT NOT
INSTALLED UNDER THIS SECTION
PRODUCTS INSTALLED BUT NOT
FURNISHED UNDER THIS SECTION
RELATED SECTIONS
ALLOWANCES
UNIT PRICES
ALTERNATES/ALTERNATIVES

REFERENCES

DEFINITIONS

SYSTEM DESCRIPTION

DESIGN REQUIREMENTS
PERFORMANCE REQUIREMENTS

SUBMITTALS

PRODUCT DATA
SHOP DRAWINGS
SAMPLES
QUALITY CONTROL SUBMITTALS
CONTRACT CLOSEOUT SUBMITTALS

QUALITY ASSURANCE

QUALIFICATIONS
REGULATORY REQUIREMENTS
CERTIFICATIONS
FIELD SAMPLES
PRE-INSTALLATION CONFERENCE

DELIVERY, STORAGE AND HANDLING

PACKING AND SHIPPING
ACCEPTANCE AT SITE
STORAGE AND PROTECTION

PROJECT/SITE CONDITIONS

ENVIRONMENTAL REQUIREMENTS
EXISTING CONDITIONS
FIELD MEASUREMENTS

SEQUENCING AND SCHEDULING

WARRANTY

MAINTENANCE

PART 2-PRODUCTS

MANUFACTURERS

MATERIALS

MANUFACTURED UNITS

EQUIPMENT

COMPONENTS

ACCESSORIES

MIXES

FABRICATION

SHOP ASSEMBLY
SHOP/FACTORY/FINISHING
TOLERANCES

SOURCE QUALITY CONTROL

TESTS
INSPECTION
VERIFICATION OF PERFORMANCE

PART 3-EXECUTION

EXAMINATION

VERIFICATION OF CONDITIONS

PREPARATION

PROTECTION
SURFACE PREPARATION

ERECTION INSTALLATION

APPLICATION

SPECIAL TECHNIQUES
INTERFACE WITH OTHER PRODUCTS
TOLERANCES

FIELD QUALITY CONTROL

TESTS
INSPECTION
MANUFACTURER'S FIELD SERVICE

ADJUSTING

CLEANING

DEMONSTRATION

PROTECTION

SCHEDULES

METHODS OF SPECIFYING

- DESCRIPTIVE - DEFINES PROPERTIES OF MATERIALS AND METHODS OF INSTALLATION WITHOUT PROPRIETARY INFORMATION
- PERFORMANCE - SPECIFIES REQUIRED RESULTS AND CRITERIA USED TO VERIFY PERFORMANCE
- REFERENCE STANDARD - REQUIRES PRODUCT OR PROCESS TO MEET ESTABLISHED STANDARDS
- PROPRIETARY - SPECIFIES BRAND NAMES, MODEL NUMBERS AND OTHER PROPRIETARY INFORMATION

SPECIFICATION LANGUAGE

- **BE CLEAR - USE CORRECT GRAMMAR AND AVOID AMBIGUITY ° CONVEY EXACT MEANING**
- **BE CORRECT - PRESENT SPECIFICATIONS ACCUARTELY AND PREGISELY**
- **BE COMPLETE - DO NOT LEAVE OUT IMPORTANT INFORMATION**
- **BE CONCISE - ELIMINATE UNNECESSARY WORDS, BUT NOT AT THE EXPENSE OF CLARITY, CORRECTNESS OR COMPLETENESS**

SENTENCE STRUCTURE MOODS

- **TRADITIONAL – INDICATIVE MOOD, PASSIVE VOICE °REQUIRES THE USE OF SHALL °WORDY °MONOTONOUS**
 - ADHESIVE SHALL BE SPREAD WITH NOTCHED TROWEL
 - EQUIPMENT SHALL BE INSTALLED PLUMB AND LEVEL
 - TWO COATS OF PAINT SHALL BE APPLIED TO EACH EXPOSED SURFACE

- **CSI – IMPERATIVE MOOD °VERB THAT DEFINES THE ACTION STARTS THE SENTENCE °CONCISE °EASILY UNDERSTOOD**
 - SPREAD ADHESIVE WITH NOTCHED TROWEL
 - INSTALL EQUIPMENT PLUMB AND LEVEL
 - APPLY TWO COATS OF PAINT TO EACH EXPOSED SURFACE

SENTENCE STRUCTURE GUIDELINES

- USE SHORT SENTENCES
- MAINTAIN SIMPLE, DECLARATIVE STATEMENTS
- AVOID COMPLICATED SENTENCES WHERE OMISSIONS OR PUNCTUATION ERRORS CAN CHANGE THE INTENT
- USE WORDS THAT ARE CLEARLY UNDERSTOOD
 - USE THE DICTIONARY