**USER GUIDE OF CIVIL WORKS MASTER SPECIFICATION**

**FOR**

**CONSTRUCTION OF PROVINCIAL WATER MANAGEMENT PROJECTS**

**1. INTRODUCTION**

 .1 Civil Works Master Specification (CWMS) is part of Alberta Transportation (AT) Master Specifications and Standards documents. The structure is based on the Construction Specifications Canada (CSC) and Construction Specifications Institute (CSI) publication “MasterFormat.”

 .2 CWMS is the standard specification to be used by consulting engineers when developing contracts for the construction of medium to large water management projects that are owned by the Province. The construction contracts are between Alberta Transportation and contractors.

 .3 Although use of CWMS is mandatory, the consultant remains fully responsible for the contract specifications. Appropriate use of CWMS requires personnel who are experienced in the design and construction of water management projects, and qualified to judge and edit its content and to ensure the specification is suitable for the contract requirements. The consultant should appoint one person to co-ordinate the interdisciplinary review and assembly of the specifications and drawings.

 .4 Provincial water management projects may involve dams, spillways, canals, control structures, erosion abatement works, and flood control dykes.

**2. PURPOSE OF CWMS**

 .1 CWMS was developed to:

 .1 ensure consistency in the content and quality of contract specifications,

 .2 establish AT’s bidding, contracting, technical standards and contract administration procedures,

 .3 provide AT’s design consultants with a “production tool” for the preparation of contract specifications, reducing contract development and review time, and

 .4 serves as part of AT’s corporate memory on water management work.

**3. PHILOSOPHY OF CWMS**

 .1 Structure: An AT’s contract document based on CWMS consists of divisions and sections. Sections are subdivided further as in clause 4. – Format of CWMS.

 .2 Consistency: The various parts of the contract documents are to be developed in a consistent format and consistent language.

 .3 Readability: The contract documents are to be easily readable and understandable. The text is to be such that your reading and understanding are not interrupted by unnatural or complex wording or excessively long sentences that would require rereading.

 .4 Applicability: Although water management projects vary considerably, they generally have aspects that are similar. CWMS contains specification text that is applicable to those aspects that frequently occur in the various projects. Additional text developed for specific projects is to follow the CWMS philosophy.

 .5 Repetition: The contract documents consist of several parts that are to be read as a whole. What is required by one part is as binding as if required by all. Repetition of the same specification in different parts of the contract documents is not to occur. Cross-referencing of the various parts is also to be kept to a minimum.

**4. FORMAT OF CWMS**

 .1 CWMS consists of the bidding requirements, the conditions of the contract and the general requirements, which are specified in Division 00 and 01, and the technical specifications which are specified in Division 02 to 35. The bidding requirements and the conditions of the contract use a single column and two-column page format respectively. The general requirements and the technical specifications use the three part section format recommended by CSC and CSI.

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 .2 Each division of CWMS is divided into sections. Each page of the section contains the section number, the title, the page number and the tender number.

 .3 For Division 00 – Bidding Requirements and Conditions of Contract, each section is divided into clauses, each of which is numbered.

 .4 For Division 01 – General Requirements and for Divisions 02 to 35 – technical specifications, each section is divided into three parts: General, Products and Execution. Each part is divided into clauses each of which is given a number that relates to the part it comes under.

 .5 Individual sections contain the following:

 .1 Section Cover Sheet: The cover sheet outlines general instructions or provides general information to the specification writer. It lists all the clause headings and provides a specification note for a clause if applicable.

 .2 Specification Text: The specification text provides the standard format, the standard language and the style for the specifications. Some clauses require editing to suit the contract requirements and additional text may be required for some contracts. The specification writer refers to the cover and data sheets when preparing the text.

 .6 Individual sections may contain data sheets to provide additional and more detailed information, instruction, or samples.

 .7 For sections containing a Detailed Drawings clause, the detailed drawings are included at the back of the section.

 .8 For sections containing a Reference clause, the reference number and its full title is listed. The date of the reference is not used unless it is specifically required. The actual references are not included with the contract documents.

 .9 For sections containing a Quality Control clause, the specific activities or tests the contractor is required to perform are listed.

 .10 For sections containing a Quality Assurance clause, the specific activities or tests the Minister is required to perform are listed.

 .11 When cross-referencing other sections of the specification is necessary, both the section number and the title of the section are quoted.

 .12 When developing tables to be included in the specifications, the tables are boxed, rather than open-sided.

**5. LANGUAGE OF CWMS**

 .1 Imperative:

 .1 The specifications are written in the imperative mood and are directed to the contractor. State what is to be done, e.g., “Provide -----“ rather than “the Contractor shall provide-----“ or “Provide-----“ rather than “Ensure that-----“.

 .2 The word “will” is reserved for activities to be carried out by the Minister. The word “shall,” if it is required, is reserved for activities to be carried out by the contractor.

 .2 Consistency:

 .1 Different words that mean the same are avoided so that the reader doesn’t question why the different word was used.

 .2 Terminology that is defined and used in Division 00 is used in Divisions 01 to 35; e.g., “Receipt of the Letter of Acceptance” is used rather than “Contract Award”, “Substantial Performance of the Work” is used rather than “Completion of the Work”.

 .3 Definitions:

 .1 Defining terms in the specifications that are commonly used in the construction industry is avoided. Terms that have unique meanings or have different meanings, when a particular meaning is required, can be defined.

 .2 Only terms defined in Division 0 or elsewhere defined under a Definitions clause and proper nouns, are capitalized.

**6. STYLE/CONSISTENCY OF CWMS**

 .1 Terminology: The following terminology is avoided:

 .1 “The Contractor shall----” or “Ensure that ---.”

 .2 “The Contractor will not be paid for ---- or “the Contractor shall ---- at no cost to the Minister.” The contractor is to carry out the specified work and will allocate his costs and payments according to the Measurement Schedule and the Schedule of Prices.

 .2 Readability/Clarity:

 .1 Modifying words “all” or “any” and articles “the” and “a” are to be used to improve the readability of a sentence.

 .2 The use of subjective adjectives or unnecessary adjectives are to be avoided; e.g., “properly align,” “vertically plumb”, “neatly store in an orderly fashion”.

 .3 There are many variations of words or phrases that have the same meaning. When developing additional articles or additional sections for a particular contract, use the wording of CWMS when possible. For the sake of consistency, certain words, phrases, and sentence structuring have been adopted for CWMS. Examples are listed below. These examples were chosen based on a review of different construction contracts and the many wording variations that were encountered.

 Use “in accordance with” rather than “conforming to” or “which conforms to the requirements of.”

 Use “record drawings” or “record surveys” rather than “as built drawings” or “as built surveys.”

 Use “receipt of the Letter of Acceptance” rather than “contract award.”

 Use “date of Substantial Performance of the Work” rather than “completion date.”

 Use “Certificate of Substantial Performance of the Work”, rather than “completion certificate” or “letter of substantial completion”.

 Use “lines, grades, slopes, and elevations” rather than “limit lines” or “design lines.”

 Use “authorized” rather than “approved.”

 Use “as specified in the Contract Documents” rather than “as shown on the Drawings.”

 Use “co-operate” and “co-ordinate” rather than “cooperate” and “coordinate.”

 Use “2H:1V” rather than “2:1” or “2 horizontal to 1 vertical.”

 Use “%” rather than “percent.”

 Use numerals rather than writing the number; i.e., use “8” rather than “eight.”

 Use “provide” rather than “supply” or “furnish.”

 Use “that” rather than “which” when something specific is being referenced.

 Use “Schedule of Prices” rather than “payment schedule.”

 Use “g/m2” rather than “grams per square metre.”

 Use “ground water” rather than “underground water.”

 Use “submittals” rather than “submissions.”

 Use millimetres for length: “600 mm”, and without the comma in “1500 mm”, and “6000 mm”. Use metres only where the industry’s common language suggests that “metres” is suitable.

**7. EDITING CWMS**

 .1 Do not include in the contract specifications the cover sheets and data sheets of CWMS.

 .2 Before editing, review the CWMS table of contents, cover sheets, data sheets and specification text. This will provide an overview of the content of a section, identify subjects that may require further investigation, identify decisions that may need to be made and help determine the best editing sequence for a section.

 When editing sections or creating new sections maintain the philosophy, format, language, and style of CWMS.

 Develop new sections from existing specifications available from www.transportation.alberta.ca. The link “Technical Resources” contains a large volume of specifications, technical, and guideline information for highway, bridge, and building construction. The structure of the building specifications is based on MasterFormat and the philosophy, format, language and style is compatible with the CWMS. In addition, complete requirements for mechanical, electrical, security, commissioning and other specialty sections may be readily modified for use on water management projects.

 .3 As a general rule, limit new sections to 10 pages. If necessary the content of a section can be organized into two or more narrower-scope sections to limit the number of pages.

 .4 Do not modify the format of CWMS provided; i.e., fonts, font sizes, margins, indents, numbering, style sheets, three part section format, streamlined point form style, imperative mood, active voice, and no large block paragraphs.

 .5 Avoid splitting paragraphs or clauses between pages. Do not separate clause headings from the following paragraph or clause on a following page. Use the techniques provided for this purpose in the word processing program, i.e., Format/Paragraph/Line and Page Breaks, “keep lines together” and “keep with next” codes in MS Word. Do not insert forced page breaks or multiple paragraph spaces to do this.

 .6 Delete inapplicable text. Beware of the natural tendency to over-specify by retaining text when its appropriateness or necessity is in question. Including such text can:

 .1 obscure the true nature or requirements of the work causing bidders to include unnecessary contingencies when pricing the work,

 .2 create ambiguities and conflicts, and

 .3 detracts from the overall quality of the contract specification.

 .7 When a clause heading is deleted, use “Not Used” adjacent to the clause number in the space previously occupied by the clause heading. Renumbering the rest of the clauses is then not necessary. However, if a paragraph and sub-paragraph is deleted, the paragraph and sub-paragraph number must also be deleted and the remaining paragraphs and sub-paragraphs renumbered.

 .8 CWMS text within square brackets ([ ]) requires an informed choice be made from options provided. Empty square brackets indicate that information must be inserted.

 .9 After editing, proof read each section for errors and omissions. Ensure proper numbering sequences and sub-paragraphs indents have been maintained. Check any cross-referencing and ensure the numbering is still correct.

 .10 If there has been a significant time lapse (1-month) since the development of a contract specification started, check to determine if there has been any specification updates. If so use the updated version rather than the original version.

 .11 Prepare a table of contents for the edited contract specifications. List all documents that are to be appended to any section.

**8. COMPILATION OF CONTRACT SPECIFICATIONS AND DRAWINGS FOR REVIEW**

 .1 Submit specification drafts ensuring that:

 .1 all pages have been properly oriented and formatted in a manner that is consistent with CWMS,

 .2 PDF files have been compiled into one file and each section has been bookmarked, and

 .3 a hard copy printed from the PDF files has been thoroughly checked.

 .2 Scanning information documents to create electronic files frequently produce files that are too large to send by email, or to access online. While scanning, keep file sizes to 8MB. If necessary, limit the document to between 1 and 3 files. Scan using “line art” or similar type, while avoiding “grey scale” imaging. Scan at 300dpi where possible.

**9. SUBMISSION OF CONTRACT SPECIFICATIONS FOR TENDER**

 .1 Refer to the Engineering Consultant Guidelines for details on submission requirements of the contract documents.

**10. CHANGES TO CWMS –**

 .1 Suggested changes to CWMS should be submitted to:

 Director, Water Management Section

 Major Capital Projects Branch

 Alberta Transportation

 Edmonton, Alberta

**END OF INTRODUCTION**