

WATER AGENCIES' STANDARDS

Design Guidelines for Water and Sewer Facilities

SECTION 3.5 TECHNICAL SPECIFICATIONS

3.5.1 PURPOSE

The purpose of this section is to provide guidelines for preparation of technical specifications and special provision specifications to be included within contract documents for the construction of capital improvement projects.

3.5.2 STANDARD TERMS AND DEFINITIONS

Wherever technical terms or pronouns occur in these guidelines or in related documents, the intent and meaning shall be interpreted as described in Standard Terms and Definitions.

3.5.3 GENERAL

It is the responsibility of the user of these documents to make reference to and/or utilize industry standards not otherwise directly referenced within this document. The Engineer of Work may not deviate from the criteria presented in this section without prior written approval of the Agency Engineer.

3.5.4 GUIDELINE

A. Contract Documents: The Contract Documents otherwise known as "Project Front Ends" are typically written, assembled and maintained by the Agency. Contract Documents are typically not changed without review by the Agency's legal council and contain but not limited to the following documents:

1. Introductory Information:
 - Project Title Page
 - Table of Contents
 - Notice to Bidders
2. Bidding Requirements:
 - Instructions to Bidders
 - Bid Proposal Forms
 - Bid Bonds
 - List of Subcontractors
3. Contract Forms:
 - Contract/Agreement
 - Performance and Materials Bond
 - Certificates of Insurance
4. Conditions of the Contract:
 - General Conditions
 - Specific Conditions

- B. Technical Specifications: The technical specifications are considered to be that portion of the job specifications that specifically detail the quality of materials and the acceptable level of workmanship required for completion of the work. Technical specifications shall:
1. Be clear, concise, and technically accurate and effectively communicate to the Contractor and its staff the intent and details needed to construct the project. The author should keep the audience in mind when preparing a document. A readability test could be run and the Flesch-Kincaid Grade Level targeted at eight (8).
 2. Be organized and formatted to provide consistent language and a uniform appearance throughout the specifications. The Agency can instruct and/or provide samples of document formatting. The WAS is also available at www.sdwas.com for format examples.
 3. Be thoroughly but not excessively detailed. In general, the language of the technical specifications must be adequate to completely describe the work contemplated such that prospective contractors have a thorough understanding of the Agency's expectations. Specifications shall be written in such a manner that all factors relevant to completion of the work are included.
 4. Be prepared specifically for each job and shall not contain references to materials or execution requirements that are not required for the proper completion of the work.
 5. Contain a footer with the name of the section, section number, page number, total pages and date. Other information may be required by the Agency.
 6. Be prepared using Microsoft Word as required by the Agency.
- B. Construction Drawings versus Specifications: A convention has developed through the years regarding what information should appear on the drawings rather than in the specifications. The understandings are based on some broad general principles as follows:
1. The drawings should be used to convey information that is most easily and effectively expressed graphically by means of drawings and diagrams.
 2. The specifications should be used to convey information that is most easily and efficiently transmitted by words, such as descriptions, standards, and procedures.
 3. Drawings should be used to express quantities, while specifications should be used to describe quality and processes.
 4. Drawings should be as specific as possible since the Contractor typically puts more effort into reviewing drawings than reading specifications.
 5. Drawings and specifications should not repeat the same information keeping the chance for errors to a minimum.
- C. Preparation of Specifications: Construction/Contract documents consist of Bidding Requirements, General Conditions, Contract Forms, Conditions of the Contract and addenda's. Bidding Requirements, General Conditions, Contract Forms and Conditions of the Contract (also known as project front ends) are prepared by the Agency. A copy can be made available to the Engineer of Work to mark-up with suggested project specific modifications. The specifications are typically prepared by the Engineer of Work.

The technical specifications shall be prepared utilizing the Construction Specifications Institute (CSI) sixteen (16) division format. The CSI categorizes information into sixteen (16) divisions associated with products and systems. The sixteen (16) divisions are as follows:

Division 1 – General Requirements	Division 9 – Finishes
Division 2 – Site work	Division 10 – Specialties
Division 3 – Concrete	Division 11 – Equipment
Division 4 – Masonry	Division 12 – Furnishings
Division 5 – Metals	Division 13 – Special Construction
Division 6 – Wood and Plastics	Division 14 – Conveying Systems
Division 7 – Thermal and Moisture Protection	Division 15 – Mechanical
Division 8 – Doors and Windows	Division 16 – Electrical

Each of the specification sections are broken into parts, each covers one or more segments of the total project. Sections are included in a project specification as needed to meet project requirements. A section is a portion of a division. Three groups of related information that make up a section include:

- Part 1 GENERAL - Covers the work in general terms. This part includes applications, administrative and procedural requirements unique to the particular section.
- Part 2 MATERIALS - Describes the materials, systems, equipment, products, fabrications, and mixes that are required for incorporation into the project.
- Part 3 EXECUTION - Covers installation or application. This part includes the manner in which items covered in Part 2 are to be incorporated into the project.

CSI utilizes a five (5) digit numbering system for numbering each specification section (i.e. 02223 or 15061). The numbering corresponds with the Division in which specification section discipline falls. The Agency may have a Master Table of Contents developed for the specification author to follow.

3.5.5 ORDER OF PRECEDENCE

In general, the specifications included as a part of the contract documents are used to supplement the Agency's Standard Specifications, and therefore, items of work required for project construction already detailed within the Agency's Standard Specifications need not be repeated within the specifications prepared for the job.

3.5.6 REFERENCED STANDARDS

Publications listed within the specification form a part of the specification to the extent referenced. Reference shall be made to the latest edition of said standards unless otherwise called for. Reference standards may include but not limited to the following:

- A. The Agency's Standard Specifications.
- B. Water Agencies' Standards (WAS).
- C. San Diego Area Regional Standard Drawings.
- D. Standard Specifications for Public Works Construction (SSPWC) also known as "Greenbook".

- E. San Diego Regional Supplements to the "Greenbook".
- F. American Water Works Association Standards (AWWA).

3.5.7 DELIVERABLES

The Engineer of Work assumes full responsibility for project specific use of the specifications. The project Construction/Contract documents will require the stamp of a California registered professional engineer, his or her signature, and the date below the seal.

All final specifications shall be submitted to the Agency on compact disk (CD ROM). Include original Microsoft Word (.doc) and Microsoft Excel (.xls) documents as well as all documents in Adobe PDF (.pdf) format.

3.5.8 REFERENCE

- A. Should the reader have any suggestions or questions concerning the material in this section, please contact one of the agencies listed.
- B. The publications listed below form a part of this section to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said publications unless otherwise called for. The following list of publications, as directly referenced within the body of this document, has been provided for the user's convenience. It is the responsibility of the user of these documents to make reference to and/or utilize industry standards not otherwise directly referenced within this document.

END OF SECTION