
Writing Specifications

Design Manual
Chapter 120
Specifications

Originally Issued: 07-12-10

Revised: 06-12-18

Occasionally, designers must write their own specifications, either for use on an individual project or as a proposed revision to the Standard Specifications. This section provides guidelines to use when writing specifications.

A particular style and format is used for writing specifications. One convenient resource for writing specifications is the [Standard Specifications](#) book. It demonstrates the preferred formatting and wording of specifications used at the Iowa DOT.

Method Specifications vs End-result Specifications

Method specifications describe step-by-step exactly how to fabricate, erect, and install materials to construct an end product (tell the contractor how to build it).

End-result specifications describe the requirements for an end product, and the contractor devises the steps needed to construct a product that complies with stated requirements (tell the contractor what is wanted and they will figure out how to build it).

The Five C's

For specifications to be effective, they must be concise, clear, complete, correct, and consistent. These are referred to as "the Five C's".

Concise

Use simple words and try to keep sentences to 25 words or less. Try to limit paragraphs to five sentences or less. Limit each sentence to one thought and each paragraph to one topic.

Clear

Avoid words or sentences that can be interpreted in more than one way. For example, words like "accurate," "clean," "reasonable," and "sufficient" can mean different things to different people.

Avoid using "and/or." Instead of "A and/or B," use "either A or B, or both."

Avoid repeating requirements or providing reasons to back up a requirement.

Do not restate information found in the plans.

Complete

Use the five part format:

DESCRIPTION

A short and concise statement of the work required.

MATERIALS

A list of the materials required to complete the work.

CONSTRUCTION

A description of the requirements for completion and acceptance of the work.

METHOD OF MEASUREMENT

A description of the procedures used to measure the pay items. Include units of measurement, how items will be measured (plan quantity, placed, etc.), and measurement factors such as temperature, waste, spillage, etc.

BASIS OF PAYMENT

A definition of pay items needed to complete the work. Include incidental items.

Correct

Thoroughly research information to be sure that it is correct. Make sure references are correct and up-to-date.

Make sure spelling, grammar, and punctuation are correct.

Consistent

Be consistent with punctuation, grammar, word usage, format, referencing, and the use of abbreviations and numbers.

Abbreviations, Symbols, and Numbers

[Article 1101.02](#) lists definitions for several abbreviations used in the Standard Specifications. When introducing an abbreviation that is not in Article 1101.02, spell it out first followed by the abbreviation in parentheses.

Example: Ensure the moisture content of sawed material treated with chromated copper arsenate (CCA) is no more than 20% prior to treatment.

Spell out all months and days of the week.

Do not use contractions, for example: isn't, don't, or aren't.

Abbreviations to Avoid

- Use “also known as” instead of “a.k.a.”
- Use “for example” instead of “e.g.”
- Use “and other things” or “and so forth” instead of “etc.”
- Use “in other words” or “that is” instead of “i.e.”
- Use “and” instead of “&”
- Use “additional” instead of “addl.”
- Use “amount” instead of “amt.”
- Use “approximately” instead of “approx.”
- Use “average” instead of “avg.”
- Use “each” instead of “ea.”
- Use “including” instead of “incl.”
- Use “manufacturer” instead of “mfr.”
- Use “quantity” instead of “qty.”
- Use “section” instead of “sec.”
- Use “standard” instead of “std.”

Allowable Abbreviations

- “Iowa DOT” (but not “IDOT”) for “Iowa Department of Transportation.”
- “No.” for “number” when referring to a particular item, for example Gradation No. 32 in the Aggregate Gradation Table, or the No. 200 sieve, or insulated No. 22 AWG wire.
- In the names of businesses:
 - Use “Co.” for “Company.”
 - Use “Corp.” for “Corporation.”
 - Use “Inc.” for “Incorporated.”
 - Use “Ltd.” for “Limited.”

Symbols

- Use “%” after a number. Spell out “percent” in other situations.
- Use “°” for temperature. Spell “degrees” out for an angle.
- Use “±” instead of “plus or minus.”
- Use “less than” instead of “<”

Numbers

- Spell out ordinals: first, second, third, fourth; not 1st, 2nd, 3rd, 4th.
- Use commas in numerical values of five or more digits.
Examples: 1500 feet, 12,000 gallons.
- Always use numerals when designating a technical measurement, including hours and days.
Examples: 3 inches, 12 feet, 5 gallons, 2 hours, 7 calendar days.
- Spell out the number when designating a quantity, unless the number is greater than ten.
Examples: six copies of the shop drawings, two passes with a roller, 50 repetitions.

Fractions and Decimals

- Fractions may be used with English units, but never with metric units.
Examples: a 1/4 inch bolt, a 1/2 mile detour.
- When using a whole number with a fraction, place a space between the number and the fraction.
Examples: 1 1/4 inches, 3 1/2 working days.
- Decimals may be used with English or metric units. For decimal values between 0 and 1, place a 0 before the decimal point.
Examples: 0.8 kg, 0.15 inches, 0.12 gallons.

Referencing

Do not use gender references.

- Instead of “his” or “he” use “they,” “their,” “the Contractor,” or reword the sentence.
- Use “quality” instead of “workmanship.”
- Use “flaggers” instead of “flagmen.”

Note: the use of “manhole” is acceptable.

Documents

- The Standard Specifications are referenced in the following manner:
 - Division 26 of the Standard Specifications
 - Section 2602 of the Standard Specifications
 - Article 2602.07 of the Standard Specifications
 - Article 2602.07, F, of the Standard Specifications
 - Article 2602.07, F, 1, of the Standard Specifications
- When referencing a Developmental Specification, Special Provision, or Supplemental Specification, use only the title. Do not include the number.
- When referencing a Materials I.M., use only the number. Do not include the title.
- ASTM references are shown in this format: ASTM C 103.
- AASHTO references are shown in this format:
 - AASHTO M 86/M 86M if the standard is available in both English and metric units.
 - AASHTO M 198 if the standard is available in English units only.

Entities

The following items are defined in the Standard Specifications and must be capitalized as shown:

- Contracting Authority (not Owner).
- Engineer (not Owner or Inspector).
- Contractor (not Prime or subcontractor).
- Professional Engineer licensed in the State of Iowa (when referencing a licensed engineer).

Typically, references are not made to the plans; instead, references are made to the contract documents, of which the plans are a part.

Example: Refer to the contract documents for details of over-excavation of rock and wet or soft foundations.

Wording

Stating a Contractor's Responsibility

A contractor's responsibilities are described using the active voice and imperative mood. The subject is understood to be the contractor, so the subject does not need to be stated.

Example: Mark subdrain outlets with steel posts. Use steel posts meeting the requirements of Article 4154.09. Drive the posts 3 feet into the ground.

Stating a Contracting Authority or an Engineer's Responsibility

A contracting authority's or engineer's responsibilities are described using the indicative mood with either an active or passive voice. Use the active voice if the subject is doing the action. Use the passive voice if the subject is the receiver of the action or the subject is not stated.

Examples:

Active: The Contracting Authority will supply all permanent signs on the project.

The Engineer will compute the volume of flowable mortar furnished and placed.

Passive: Placing backfill for construction of the shoulder area will be paid for separately.

Payment will be at the contract unit price per cubic yard for the quantity of backfill material furnished.

Stating the Method of Measurement

- When payment is by plan quantity, state the following: “Measurement for *bid item description*, in *units*, will be the quantity shown in the contract documents.”

Example: Measurement for Combined Concrete Sidewalk and Retaining Wall, in cubic yards, will be the quantity shown in the contract documents.

- When payment is by measured quantity, state the following: “Measurement for *bid item description* will be in *units*.” Accuracy of measurement can also be specified.

Example: Measurement for Combined Concrete Sidewalk and Retaining Wall will be in cubic yards.

Stating the Basis of Payment

- State the following: “Payment for *bid item description* will be at the contract unit price per *unit*.”

Example: Payment for Combined Concrete Sidewalk and Retaining Wall will be at the contract unit price per cubic yard.

- Do not include the sentence, “This payment shall be full compensation for all materials, labor, and equipment necessary to complete the work.” This is covered by Division 11 of the Specifications. However, items included in the payment can be stated for clarification. Something similar to the following statement (for the example above) can be included:

Payment is full compensation for:

- Excavation and foundation preparation,
- Furnishing and placing concrete and reinforcing steel,
- Joint material,
- Subdrain,
- Porous backfill material,
- Suitable backfill material,
- Finishing disturbed areas, and
- Shoring as necessary.

Chronology of Changes to Design Manual Section:

120A-004 Writing Specifications

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| 6/12/2018 | Revised
Corrected header and fixed broken hyperlinks. |
| 7/18/2013 | Revised
Corrected header. Changed title from "How to Write Specifications" to "Writing Specifications". Numerous technical edits throughout the document. |
| 7/12/2010 | NEW
Moved from 1C-6. |