



**STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION**

***SPECIFICATIONS
AND
SPECIAL PROVISIONS
WRITING STYLE GUIDE***

MARCH 2014



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Preface

The purpose of this Style Guide is to combine specification writing instructions from many sources and provide guidance. The information includes input from the Department's Standard Specifications Committee and Contracts Processing Unit. National Highway Institute Course No. 134001A, "Principles of Writing Highway Construction Specifications," and the Federal Highway Administration's webpages were also consulted for input.

The goal of this Guide is to promote consistency among Department specification writers and those submitting revisions to existing specifications. This document provides the tools to encourage standardization of formats and writing styles, and to reduce repetition. This in turn will result in better specifications, improved communication, and less likelihood of misinterpretation of specifications between construction, design, and contractor.

The timing of this first compilation coincides with the Standard Specifications Committee's work on Form 817 of the *Standard Specifications for Roads, Bridges and Incidental Construction*. During development of Form 817 and subsequent revisions to it, this Guide is to be consulted often.

It is recommended that all Department Engineering staff and Consultant Firms that are responsible for providing special provisions for Department projects refer to this Guide.

If something is not understood or has been overlooked, proposed revisions or additions to this Guide will be accepted by the Standard Specifications Committee Chairman or Secretary.

1 General Guidance and Protocols

1.01 Definitions of Types of Specifications

Standard specifications: Specifications approved for general application and repetitive use, compiled and made available in book form. The current version of the standard specs is Form 816 published in 2004.

Supplemental specifications: Additions and revisions to the standard specifications used to update the standard specifications between publications. Requires specific approval from the Specification Committee and Federal Highway Administration (FHWA) for adoption as a formal supplement to the published book.

Special provisions: Additions and revisions to the standard and supplemental specifications that apply only to an individual project or possibly a small group of projects.

Developmental or pilot specifications: Specifications developed around a new process, procedure, or material with the prior knowledge that subsequent adjustments might be necessary prior to adoption for standard usage. Every Developmental specification is to be assigned to an Owner (therefore they are often referred to as “Owned special provisions.”)

Notice to Contractor: A Notice to Contractor (NTC) will be located at the front of a contract bid package and may be used to highlight broad or important background issues for the contractor. It may also highlight a change in contracting practices, specifications or other requirements that are different for this project than normal requirements.

The NTC should direct the contractor to the appropriate location in the contract to view the new/revised requirements or special provision. It should not be used to direct work, specify method of measurement or basis of payment, or direct which materials to use. That is the primary function of a special provision or standard specification.

1.02 Submittal Processes

Standard specifications are revised by the Standard Specifications Committee working under the guidance of an Oversight Designee (the Chief Engineer of the Bureau of Engineering and Construction) and FHWA. Recommended changes or additions are forwarded in writing to the Chairman of the Committee using a

memorandum format, as found in Appendix B of the Construction Manual and distributed to Design Unit Managers periodically by the Committee Secretary.

At the current time, developmental special provisions are distributed via memorandum to Department Unit Managers and to the Contracts Processing Unit for inclusion on the Owned Special Provisions webpage. The memorandum should include guidance for users and a time frame for incorporation into projects.

1.03 Review and Approval

Developmental special provisions that are used at least one year without major changes should be forwarded to the Standard Specifications Committee by the Owner to be considered for incorporation into the Supplemental Specifications.

The Standard Specifications Committee meets at least quarterly to discuss proposals received, recommend revisions and then vote on adoption into the Supplemental Specifications.

1.04 Feedback/Lessons Learned/Revisions

Special provision Owners should solicit and expect feedback from other Department stakeholders. There is a Lessons Learned group in the Office of Construction that can assist in getting feedback on specifications. Construction Inspectors submit Post Construction Review forms in which feedback on special provisions can be found. Possible revisions can be vetted through meetings and discussions between the affected Department units.

1.05 Additional Resources

Further guidance regarding grammar, language and common terms may be found in *The Chicago Manual of Style*. For additional information on specification adoption processes followed by the Connecticut Department of Transportation, contact the Standard Specifications Committee Chairman or Secretary.

2 Standard Specifications

2.01 Organization

The Standard Specifications contain three divisions:

Division I General Requirements and Covenants

Division II Construction Details

Division III Materials

The Divisions are broken into Sections, Articles and Subarticles as needed to describe the contractual work to be accomplished.

2.02 Numbering Sections

The current numbering of the sections of Form 816 will carry through to the next iteration, Form 817. The use of decimal points within numbered sections helps to delineate subsections of the same Division. There is no decimal point at the end of the Section number.

The Section numbers and headings are typed in bold Times New Roman font, centered at the top of the page, with the Section title capitalized as follows:

1.06 CONTROL OF MATERIALS
--

First subsections, called Articles, are in bold print, numbered after a second decimal point, then a space, dash, space, with the title in initial capital letters and a colon, as follows:

1.06.01 - Source of Supply and Quality: The Contractor must obtain ...

Generally, the first sentence of the Article begins two spaces after the colon, in regular print (not bold) and the first sentence of subsequent paragraphs are indented by two spaces

When the amount of subject matter to be covered in an Article is large, the text should be broken into Subarticles. The information covered will be more readily understood and easily referred to if it is presented in a well-ordered Subarticle. To distinguish subsections, indent entire paragraphs using consistent formatting described below.

2.03 Format - Outline

Outline format guide and examples for Sections, Articles and Subarticles:

<u>Numbering</u> {example}	<u>Section Level / Title</u> {example}	<u>Typography</u>	<u>Indentation</u>
### {1.06}	1st Level = SECTION { CONTROL OF MATERIALS }	TIMES NEW ROMAN, BOLD, ALL CAPITALS	Centered
###.### {1.06.01}	2nd Level = Article { Source of Supply and Quality }	Title Bold, Initial Capitals; text not bold, capitals when needed	Two spaces at beginning of paragraph(s)
###.### - #. {6.01.03 - 9.}	3rd Level = Subarticle { Curing Concrete }	Title Bold, Initial Capitals; text not bold, capitals when needed	Two spaces at beginning of paragraph(s)
###.### - #.(a) {6.01.03 - 9.(b)}	4th Level = Subarticle { Additional Requirements for Bridge Decks: }	Title Bold or not, Initial Capitals; text not bold, capitals when needed	(a) at margin; paragraph text indented to line up with title, two spaces after close parenthesis
###.### - #.(a)#. {6.01.03 - 9.(b)1.}	5th Level = Subarticle {Curing Plan:}	Title Bold or not, Initial Capitals; text not bold, capitals when needed	Non bold # lined up with 4th level title; paragraph text indented to line up two spaces after period
###.### - #.(a)#.A {6.01.03 - 9.(b)1.A}	6th Level = Subarticle {the initial and final curing durations,}	Title and text not bold, capitals only when needed	Capital letter lined up with 5th level title; paragraph text indented two spaces after letter

Do not repeat the second level numbers within Articles. Only use the entire numbering format when referring to specific subsections within the specification text. For example, a subsection with numerous levels would be expressed as follows:

<p>6.01.03 - Construction Methods:</p> <p>9. Curing Concrete: All newly placed concrete ...</p> <p>(b) Additional Requirements for Bridge Decks:</p> <p>1. Curing Plan:</p> <p>A. the initial and final curing durations,</p>
--

2.04 Division I - GENERAL REQUIREMENTS AND COVENANTS

Use content-specific titles for Articles. Avoid the use of “General” as a title; it dictates that cross-references from other specifications must include the immediately higher level section title in the reference.

Example:

Filing of claims will follow the requirements of Article 1.11.01, “Claims, General.”

Avoid repeating requirements or details that are covered in other Sections or Articles, use references instead.

Example:

When the Commissioner has accepted the Project in accordance with Article 1.08.14, the Engineer will prepare a final payment estimate.

Not:

The Project will be accepted by the Commissioner when all Project work has been completed, the final inspection has been held, any required additional work and/or final cleaning up have been completed, ...

Never use the phrase “and/or” as it could lead to disputes.

2.05 Division II - CONSTRUCTION DETAILS

These technical sections contain five second-level sections:

###.01 Description

###.02 Materials

###.03 Construction Methods

###.04 Method of Measurement

###.05 Basis of Payment

Use the simplest language that says clearly and accurately what needs to be said. Do not substitute synonyms for the main item discussed; it is acceptable to repeat the word or phrase as often as needed. See Chapter 5 for more information.

2.06 Division III - MATERIALS

These technical sections contain the requirements for acceptability of the materials used and provide direction on sampling, testing or standards to be met. See Chapter 5 for more information.

3 Special Provisions

3.01 Developmental, Pilot or Owned Special Provisions

Owned Special Provisions are generally found on the Department's webpage. The special provision's Owner is to be contacted (preferably by email) for usage of their special provision, especially if any revisions are involved.

3.02 Unique Project Special Provisions

3.02.01 Format - Adjustment to a Standard Specification

Often only portions of a Standard Specification need to be revised. A Special Provision can be written that refers to the existing standard, then *in italics* directs which requirements are to be revised, deleted or added.

See the following examples for recommended formatting.

SECTION 1.08 - PROSECUTION AND PROGRESS

Article 1.08.01 - Transfer of Work or Contract: *Add the following after the last paragraph:*

The Contractor shall pay the subcontractor for work performed within thirty (30) days ...

ITEM #0204001A – COFFERDAM AND DEWATERING

Cofferdam and dewatering shall be constructed in accordance with Section 2.04, supplemented as follows:

Article 2.04.01 - Description: *Add the following:*

This item shall include furnishing and installing temporary Crane Mats as shown on the plans or as directed by the Engineer.

Article 2.04.03 – Construction Method: *Add the following:*

After dewatering the site, the Contractor must place crane mats in order to minimize wetland impacts and protect the existing watercourse.

Article 2.04.05 – Basis of Payment: *Replace the first sentence with the following:*

Payment for this work will be made at the Contract unit price per linear foot for “Cofferdam and Dewatering,” which price shall include all costs of design, materials, equipment, labor, work, crane mats and any related environmental controls used in dewatering operations, which are required ...

ITEM #0910700A –TEMPORARY GUIDERAIL ATTACHMENT

Revise Section 9.10 as follows:

Article 9.10.02 - Materials: *Replace item 3 with the following:*

3. When converting rail or constructing temporary guiderail attachments, the Contractor shall reuse any undamaged existing ...

3.02.02 Format - Full Rewrite or Stand-Alone Special Provision

When the Standard Specifications do not adequately describe the item requirements or no specification exists, a special provision must be prepared.

The format for a stand-alone special provision for a Division II item is to follow the five part Article format, outlined in Chapter 2. Additional writing guidance can be found in Chapter 5.

Division I requirements should not be rewritten, deleted or added to without input from the Department's Contract Development Unit. Similarly, Division III requirement changes must be acceptable to the Division of Material Testing.

4 Notice to Contractor

4.01 Usage Limitations

Specification writers should be aware that Notices to Contractor are considered "other Contract requirements" listed last in Article 1.05.04, therefore they have the least authority. Carefully consider whether the project would be better served to have the desired information as an appropriate item Special Provision.

4.02 Format

Include the phrase "Notice to Contractor" followed by a dash, then the title of the Notice. The heading should be underlined bold capital letters. The text should be in regular print and strictly informational, as in the following example:

NOTICE TO CONTRACTOR - LOCATING TRAILERS ON THE PROJECT SITE

The Contractor is hereby advised to locate the Contractor and Engineer office trailers as well as the related portable bathroom facilities in grass areas off the pavement where shown on the plans. No alternate locations will be considered due to site operational needs and utility constraints.

Never use the five part second level section format in a Notice to Contractor.

5 Wording of Specifications

5.01 Citing References

References to other Sections or Articles within the Standard Specifications are acceptable, as noted in Chapter 2. References to other Department issued manuals, guides or documents, should be referred to by the italicized full title of the document, unless it is mentioned multiple times in the same paragraph in which case it can be shortened but still italicized.

Examples:

Materials shall conform to the requirements of M.03.

See Section 4, Adjustable Traffic Signals of the *Department of Transportation Functional Specifications for Traffic Control Equipment*, current edition. Where the *Functional Specifications* conflict with this specification, this specification shall govern.

Do not italicize or put quotation marks around established standards used as references. Whenever possible, use recognized abbreviations, such as:

Examples:

Nuts and bolts shall conform to the requirements of ASTM A 563.

This material shall conform to the requirements of AASHTO M36, Type II, Type IIR or AASHTO M 245, Type II.

The sign shall conform to Standard 6E-3 of the MUTCD and catalog number 387-80-9950 of the ConnDOT *Catalog of Signs*.

Note: Section 1.01 of the Standard Specifications contains a list of standard abbreviations. The list allows that those documents or organizations names need not be spelled out in the specifications.

5.02 Active and Passive Voice Phrasing

In directives to the Contractor, use the word “shall.” To avoid repetition of the phrase “The Contractor shall...” the Passive Voice can be used to provide direction (and use of the word “shall” implies that it is the Contractor who is to act).

Example:

ACTIVE: The Contractor shall dispose of excess sod or excess soil resulting from excavations or trenching, as approved by the Engineer.

or

PASSIVE: Excess sod or excess soil resulting from excavations or trenching shall be disposed of as approved.

When the action to be done is by the Department or the Engineer, use the word “will.” Again, “The Engineer will...” is written in the Active Voice, and in the Passive Voice using the word “will” makes it understood that the Engineer is responsible.

Example:

ACTIVE:	The Engineer will not pay for rejected or excess sod which is not used.
<i>or</i>	
PASSIVE:	Rejected or excess sod will not be paid for.

Occasionally, the requirements may dictate the use of stronger phrasing, such as “must” but this should be kept to a minimum or it will lose its emphasis.

5.03 Key Phrases in Division II Specifications

5.03.01 Description Sections

Generally begin with a statement such as “The work shall consist of ...” and describe the work referred to in the item title in as few sentences as needed. Often the phrase “as shown on the plans” is used instead of long explanations.

If there are multiple items or work units to describe, an outline format can be used to list them.

Examples:

5.13.01 - Description: This item shall consist of furnishing and installing polyvinyl chloride pipe for use as drains through the concrete bridge slab where shown on the plans or as ordered by the Engineer.

11.11.01 - Description: These items shall consist of:
--

1. Furnishing and installing a loop vehicle detector in conformity with these specifications.
--

2. Furnishing and installing Saw cut to be used with a loop vehicle detector as shown on the plans and in conformity with these specifications.
--

5.03.02 Materials Sections

List the Department’s requirements for the materials to be used in the work or provide a reference to the pertinent Division III section. A common phrase used in this section is “shall conform to the requirements of” followed by an established standard. The desired quality, storage and sample requirements for testing

purposes should also be included. Multiple requirements can be presented in a narrative or outline format.

Examples:

5.14.02 - Materials: The materials for prestressed beams and deck units shall conform to the requirements of Article M.14.01.

Prestressing and reinforcing steel shall be free of corrosion that imparts etching, pitting, or scaling of the surface. Light surface rusting shall be removed as ordered by the Engineer.

Prestressing and reinforcing steel shall be stored under shelter and kept free of deleterious material, such as grease, oil, wax, dirt, paint, loose rust, and other similar contaminants...

When called for on the plans, the deformed reinforcing steel bars shall be epoxy coated in conformance with the applicable sections of ASTM D3963(M).

A representative 8-ounce (0.23-kilogram) sample of the coating material shall be retained by the manufacturer from each batch ...

11.11.02 - Materials: The materials for this work shall conform to the requirements of Article M.16.12.

As noted in Chapter 3, materials requirements are established in conjunction with the Division of Materials Testing. For proposed items or materials that have no standard criteria, consultation with the DMT is recommended.

Another way to specify material requirements is by referring to the Department's Qualified Products List (QPL). Specification writers should work with the DMT to ensure that the desired product information is up to date in the QPL.

5.03.03 Construction Methods Sections

This section describes the requirements to construct and accept the work. It can be written as a detailed sequence of operations to be followed ("Method" specification) or can specify the quality of the desired end product ("Performance" specification). A combination of the two types is also acceptable.

Construction Methods information should complement the plans. If information overlaps, there can be duplication which may lead to errors. Actual dimensions are best shown on the plans, but tolerances can be included in the specifications.

If the work requires submittal of shop drawings, working drawings or other submittals (such as a QC Plan), outline the process to be followed.

Specify the type and frequency of tests required, and the final results necessary for acceptance. Identify which quality control activities are the Contractor's responsibility and the quality assurance methods that the Department will use.

Do not include information about how the work will be measured or paid for, unless directing the Contractor to perform work at no additional cost to the Department.

Key phrases in the Construction Methods section include:

- “as shown on the plans or as directed by the Engineer”
- “in accordance with the instructions supplied by the manufacturer”
- “installed to the lines and grades shown on the plans”
- “prior to fabrication, submit shop drawings in accordance with Article 1.05.02”
- “submit details of proposed methods for the Engineer's approval prior to the start of the construction”
- “working drawings and calculations, prepared by a Professional Engineer, licensed in the State of Connecticut”

Long paragraphs should be avoided. Breaking the information into subarticles is helpful for using as a reference or for discussion purposes later on.

5.03.04 Method of Measurement Sections

This section states how the Department will measure contract pay items. Identify the Engineer as the responsible party and include the units of measure used for each bid item. Include directions for item(s) that require Contractor input, such as trucks weighed on scales or that a Schedule of Values will be required.

Spell out the pay units immediately followed by the Metric equivalent pay units in parentheses, if applicable. The title of the item need not be capitalized.

Examples:

4.15.04 - Method of Measurement: This work will be measured by the actual number of square yards (square meters) of completed and accepted pressure relief joint.

9.47.04 - Method of Measurement: This work will be measured for payment by the number of bus passenger shelters completely installed and accepted in place.

11.18.04 - This work shall be at the Contract lump sum price for the completion of all work to remove or relocate traffic signal equipment as specified.

5.03.05 Basis of Payment Sections

This section tells how the Department will pay for measured items. In the first sentence use the word “will,” spell out the pay units and indicate the entire title of the pay item in quotation marks. Multiple items included in this specification should have similar separate sentences.

Subsequent sentences in this section should contain key information as to what is included in this payment. Work of a secondary nature within this compensation or a related main contract item should be noted.

Examples:

6.09.05 - Basis of Payment: This work will be paid for at the Contract unit price per square yard (square meter) for “Repointed Masonry” which price shall include all materials, equipment, tools and labor incidental thereto.

9.43.05 - Basis of Payment: This work will be paid for at the Contract unit price per m. gallon (kiloliter) for “Water for Dust Control,” which price shall include all water, labor, and equipment including devices to measure and apply to surfaces designated by the Engineer and at times specified.

This price shall also include all work necessary to erect, relocate, re-erect, and dismantle the entire water equipment system.

10.11.05 - Basis of Payment: This work will be paid for at the Contract unit price per linear foot (meter) for “4-Inch (102-Millimeter) Drain Pipe,” complete in place, which price shall include all materials, elbows, fittings, wire screens, and all equipment, tools and labor incidental thereto. Trenching and backfilling shall conform to and will be paid for under Article 10.01.05.

9.80.05—Basis of Payment: Construction staking will be paid for at the Contract lump sum price for "Construction Staking," which price shall include all materials, tools, equipment, labor and work incidental thereto. A schedule of values for payment shall be submitted to the Department for review and comment prior to payment.

Full rewrites of standard specifications and special provisions should include a Pay Item - Pay Unit table, right after the Basis of Payment section text.

Example:

Pay Item	Pay Unit
4 Inch (102 mm) Drain Pipe	l.f. (m)

6 Numbers in Specifications

6.01 Common Usage

Use numerals for values greater than ten.

Example:

The Department will not close traffic lanes for routine maintenance on roadways with posted speed limits greater than 25 mph.

Use words for numbers at the beginning of a sentence; if a number greater than ten appears at the beginning of a sentence, reorder the sentence if possible.

Examples:

Eight hours of labor constitutes a full day of work.
Thirty minutes before installation, begin preparing the material.
Or:
Begin preparing the material 30 minutes before installation.

Use words for quantities or values of ten and below that are not critical, precise, or of paramount importance in the context.

Examples:

Fabricate from no greater than two pieces of sheet steel.
The Engineer will provide six sets of drawings.
Perform maintenance for up to three years.

Add s to form the plural of numbers used as nouns.

Example:

twos and threes

When quantity and size are expressed together, use words for the quantity and numerals for the size.

Examples:

two 12 penny nails
three 13 mm holes
twenty-two 5 lb weights

Be consistent. Within the same context, treat similarly all numbers that refer to the same category of things.

Examples:

Hold the vibrator from 5 sec to 15 sec.
... 30 min before starting, and again 60 min later ...
... either formed or sawed 1/4 inch wide and 2 1/2 inches deep.

6.02 Decimals and Fractions

Express decimals in numerals, not words.

Example:

0.1 *Not:* one-tenth

Never leave a decimal point “naked”—that is, without numerals on both sides.

Examples:

1.5
6.125
0.5
0.125

Use numerals for mixed numbers; leave a space between the whole number and fraction.

Examples:

Join the top to the bottom with an arc of not more than 87 1/2 degrees.
Leave a distance of no more than 1 3/4 times the diameter of the bolt.

In most computer programs, commonly used fractions like 1/2, 1/4 and 3/4 will automatically reduce the font size, which is sometimes difficult to read. It is recommended that this feature be turned off or in the case of only a few instances, type the numerator followed by a space then the slash, followed by the denominator. Go back and delete the space.

Express metric values in consistent units; use decimals instead of fractions:

Examples:

a pipe length of 1.73 m *Not:* a pipe length of 1 m, 73 cm
8.5 kg *Not:* 8 1/2 kg

Use words for simple fractions that do not describe a measurement or a precise quantity, for fractions that stand alone, and for fractions that come before the words “of a” or “of an.” Connect the numerator and denominator with a hyphen.

Examples:

Add mulch when the tank is at least one-third full of water.
Use a spray bar at least three-fourths the length of the mixer.
The Department will pay one-half the unit price.

6.03 Time and Date

Use numerals for clock times. Keep zeroes when describing times “on the hour.” Use the 12 hour system, with all numerals accompanied by the appropriate a.m. or p.m. designation (using lower-case letters, followed by periods); leave a space between the numeral and abbreviation but no spaces inside the abbreviation. Do not use the contraction “o’clock” after the numeral.

Examples:

9:00 a.m. *Not:* 9 o’clock a.m.
10:30 p.m.
during the hours from 10:00 a.m. to 4:30 p.m. on the day

Exception: Use the words noon and midnight to indicate twelve o’clock. Do not use the numeral 12 followed by a word or abbreviation.

Example:

Do not work from noon to midnight. *Not:* 12 noon or 12 p.m.
Not: 12 midnight or 12 a.m.

Use words (written in full) for the names of months and numerals for days of the month and years. Do not use ordinal designators (e.g., th and rd) in dates.

Examples:

June 15, 2001 *Not:* June 15th, 2001
from May 1 to September 30

Use numerals with an ordinal designator to specify a fixed number of days from and event or starting point.

Examples:

by the 15th day of receipt *Not:* by the fifteenth day of receipt
the 21st day of the month *Not:* the twenty-first day of the month

6.04 Money

Use numerals for monetary amounts. Use commas to separate groups of thousands when expressing dollar amounts greater than \$999. Do not include the decimal and zeroes for cents when amounts are in whole dollars; do not leave a space between the dollar sign (\$) and the numeric value.

Examples:

\$10,000
a subcontract of \$5,000 or more
pay the State at the rate of \$2.75 per cubic yard
the sum of \$100 for each calendar day

Do not express dollar values with repetitive word phrases.

Example:

more than \$50 for each day *Not:* more than fifty dollars (\$50) for each day

To encourage reader comprehension, when expressing large, round sums, use the word million (or billion) plus a numeral and dollar sign.

Examples:

\$1 million for each accident *not:* \$1,000,000 for each accident
\$15 million aggregate *not:* \$15,000,000 aggregate
But:
\$1,550,000 *Not:* \$1 million, five-hundred-fifty thousand
\$20,100,000 *Not:* \$20 million, one-hundred thousand

6.05 Percent

Use the word percent in the text and precede with a numeral.

Examples:

average density less than 95 percent
changes greater than 5 percent
a minimum of 4 percent moisture
provided the quantity does not exceed 0.1 percent *Not:* one-tenth of one percent

Use the symbol % in tables or other lists of data.

Examples:

Air Content, % Fine aggregate, by soil volume of total aggregate, % using 0.5% cobalt, 0.03% manganese and 0.3% zirconium

7 Abbreviations, Acronyms and Symbols

7.01 Rules for Usage

Be consistent. The accepted forms of more widely used abbreviations can be found in Section 1.01 of Form 816. Do not invent or use forms that vary from these sources, such as including periods where none are shown in Section 1.01.

If an abbreviation or acronym is not found in Section 1.01, before using it write out the complete name or phrase at the first usage, followed immediately with the shortened form in parentheses. When the word or phrase contains common nouns and adjectives, use lowercase letters in the full words and capital letters in the short form.

Examples:

Horizontal elliptical reinforced concrete pipe (HERCP) ... Install the HERCP so that ... The Contractor is responsible for notifying “Call Before You Dig” (CBYD) ...
--

Use the indefinite article “an” before abbreviations and acronyms that are pronounced as if they begin with a vowel. If the short form begins as though pronounced with a consonant, use “a.”

Examples:

an AASHTO requirement an SAE specification (because the letter s is pronounced ess) a PSC document a U.S. Code (because the letter u is pronounced yoo)
--

7.02 Units of Measure

Commonly used units of measure can be found in Form 816. Use numerals for the value of a measurement, usually followed by one space, then the established symbol or abbreviated unit of measure. Do not use words for the number. Words or symbols can be used for the unit of measure. The only time that a unit of measure must be spelled out is when the unit is used without an accompanying numeral, such as in the Method of Measurement and Basis of Payment sections of specifications.

Because there are still some Metric projects, the standard specifications and supplements will continue to have dual units (English unit first, followed by one space, then the Metric equivalent in parentheses). Conversion factors are found in the back of Form 816.

Special provisions should be written with the units that the project has been designed in being primary. Note also that some established standards (such as SSPC thickness standards) may only be available in one set of units.

- Do not add an “s” to form a plural. The symbol remains the same regardless of the quantity.
- Ensure that the numeral and symbol are on the same line in the text.

Examples:

a 10 l.f. (3 m) long straightedge round to a radius of 1/2 in (13 mm) 36 ton (32.65 t) 48 hr <i>Not</i> 48 hrs

7.03 Symbols

Specifications often contain common mathematical or other symbols. Microsoft Word contains additional symbols and special characters found by opening the Insert menu and selecting Symbols. Do not invent or use forms that vary from the agreed upon symbols.

Examples

material passing the No. 100 (150 μ m) sieve 2 in x 2 in x 1/4 in (50 mm x 50 mm x 6.4 mm) lamp circuits shall be #14 AWG stranded drawn copper add water heated to a temperature of from 70 °F to 150 °F (21 °C to 66 °C) Resistance \leq 25 Ω
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7.04 Ranges, Tolerances, Minimum and Maximum

In text, indicate a range that includes the endpoints by using the words “from” and “to.” The word “inclusive” may be added as appropriate to increase clarity. Provide the unit symbol after each numeric value. Do not use a dash, which can be easily confused with a minus sign.

In tables, use the greater than ($>$) and less than ($<$) symbols for a range from which the endpoints are excluded. Use the symbols for greater than or equal to (\geq) or less than or equal to (\leq) to indicate the inclusion of an endpoint or endpoints in a range.

Tolerances define the allowable variation from a specified standard. Provide the unit of measure with both the numeric value of the standard and the allowed variation around the standard.

When the variation is the same above and below the standard, use the \pm symbol directly before the numeric value (no space between).

When the specification allows different values above and below the standard, give the standard value, the positive value (with a plus sign), then a comma, followed by the negative value (with a minus sign).

Examples:

thickness as shown on the plans with a tolerance of $\pm 3/4$ in (± 19 mm) 3 in $+1/2$ in, $-3/4$ in (76.2 mm $+13$ mm, -19 mm) with HRWR, concrete slump of 4 in $+3$ in, -1 in (100 mm $+75$ mm, -25 mm)

Avoid abbreviating minimum, maximum, or minutes. The symbol “min” represents the unit of time called a minute. To avoid potential confusion, do not use the similar looking abbreviation for the word minimum (i.e., “min.”). In the text use alternate phrases such as “no greater than” in place of maximum and “no less than” or “at least” in place of minimum.
