

CHAPTER 6 — ADDITIONAL DRAFTING CONVENTIONS

6.1 SHORTENED FORMS: ABBREVIATIONS, ACRONYMS, AND SYMBOLS

Definitions

Abbreviations, acronyms, and symbols are shortened forms of longer words, names, or expressions. Each of these short forms differs from the others in formation and usage.

Abbreviations. Shortened forms of a single word or phrase, usually followed by a period and often including lowercase letters.

Examples:

etc., min., max.

Acronyms. Shortened forms, often initialisms, that can be pronounced as a word. Do not use periods in an acronym.

Examples:

AASHTO and OSHA

Symbols. Free-standing characters, letters, or signs with unique agreed-on meanings. Do not treat or punctuate symbols as if they were abbreviations. Use a space before and after a symbol; do not precede a symbol with a hyphen or follow with a period.

Example:

kg, m³

General Guidelines for Shortened Forms

As a general principle, shortened forms should be used as much for the convenience of the reader as of the writer. Adherence to the guidelines presented below will help prevent shortened forms from burdening the reader.

1. Be consistent in the use of short forms. Distinct short forms used repeatedly in FLH specifications are listed in Section 101.03 of the Standard Specifications. The accepted forms of more widely used abbreviations can be found in Chapter 14, “Abbreviations,” of *The Chicago Manual of Style* or Chapters 9 and 10, “Abbreviations and Letter Symbols” and “Signs and Symbols,” of the *United States Government Printing Office Style Manual, 2000*.

If a shortened form is defined in Section 101.03, such as PVC for polyvinyl chloride, it is not necessary to precede the shortened form with the complete name in the specifications.

2. Before introducing a shortened form not listed in Section 101.03 of the FP, 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.
3. Do not introduce a shortened form that will not be reused in the same section; instead, simply write the words out. When reintroducing a short form in another section, write out the complete name or meaning, followed by the short form in parentheses, at the first usage.
4. Do not put an abbreviation or acronym in a title unless it is a well known, universally familiar form.
5. 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*.
6. Form plural short forms by adding the lowercase letter *s*. Do not use an apostrophe. For example, the plural for the abbreviation for number, *No.*, is *Nos.* *not* No's.

6.2 STYLE FOR MEASUREMENTS

Measurements describe quantities and consist of a *numeric value* and a *unit of measure*. General conventions regarding the use of measurements in the Standard Specifications are provided below.

1. Use numerals for the value of measurement. Provide a hard space, as described in Section 8.2, between the numeral and measurement unit. A hard space prevents the number and symbol from becoming separated across lines of text.

Example:

Correct	Incorrect
Cover the top layer of buried debris with at least 1 foot of compacted earth.	Cover the top layer of buried debris with at least <i>one</i> foot of compacted earth.

2. For units of measure provided in text (as opposed to tables), write the full word instead of using symbols or abbreviations (with the exception of temperature measurement). In tables, symbols may be used.

Example:

Correct	Incorrect
Construct at intervals not exceeding 20 feet.	Construct at intervals not exceeding 20 <i>ft.</i>
Apply the asphalt sealant to the pavement surface at a rate of 0.20 to 0.30 gallons per square yard.	Apply the asphalt sealant to the pavement surface at a rate of 0.20 to 0.30 <i>gal/yd²</i> .

- For temperature, use the degree symbol and the abbreviation for Fahrenheit and Celsius. Provide a hard (nonbreaking) space between the numeral and symbol. Provide no space between the degree symbol and the temperature abbreviation (for example, 7 °C, 100 °F).

Example:

Apply asphalt at a temperature between 150 and 175 °C.

- For angular measurement, write out the word *degree* (for example, 90-degree angle to the vertical).

Example:

Place elongated pipes with major axis within 5 degrees of vertical.

- Names of basic and derived units of measurement are always lowercased even if they are derived from a personal name (for example, newton, hertz, pascal).

Example:

Four roller passes of a vibratory roller having a minimum dynamic force of 180 kilonewtons impact per vibration and a minimum frequency of 16 hertz.

- Use plural forms as necessary (for example, 1 foot vs. 2 feet; 1 meter vs. 2 meters).

Examples:

Place bed course material in layers not exceeding 4 inches in compacted thickness.

- To indicate dimensionality, use the word *by* not the multiplication cross symbol (x).

Example:

Limit drawings to a maximum size of 610 by 920 millimeters.

- When measurements are used as adjectives, connect the numeric value and the unit of measure with a hyphen (see Section 7.7).

6.3 MEASUREMENT SYMBOLS

Measurement symbols (for example, ft, lb, in, min) are to be used in tables and figures only. To use measurement symbols properly in tables:

1. Do not follow measurement symbols with a period unless dictated by placement at the end of a sentence. Measurement symbols are not abbreviations.
2. Do not add an *s* to form a plural. The symbol remains the same whether the quantity is one or many.

Examples:

Correct	Incorrect
2 lb	2 lbs
24 h	24 hrs

3. Type a space between the quantity and the symbol.

Examples:

1 lb, 2 ft, 60 °F

4. Precede symbols only with numerals, never words.

Example:

Correct	Incorrect
2 ft	two ft

5. Do not mix symbols and names in the same expression.

Example:

Correct	Incorrect
ft/s	feet/s
feet per second	feet/second

6. Print symbols and quantities in normal, upright (roman) type regardless of surrounding text.

Example:

Correct	Incorrect
2 ft	2 <i>ft</i>

7. Do not use symbolic representations.

Example:

Correct	Incorrect
2 ft	2'
6 in	6"

6.4 MATHEMATICAL AND OTHER SIGNS AND SYMBOLS

Use signs and symbols as shown in Table 6-1:

**Table 6-1
Signs and Symbols**

Sign or symbol	Meaning	Use in ...	
		Tables only	Text and tables
+	Plus	✓	
-	Minus	✓	
±	plus or minus		✓
=	equal to	✓	
<	less than	✓	
≤	less than or equal to	✓	
>	greater than	✓	
≥	greater than or equal to	✓	
×	multiplied by; dimensional indicator	✓	
μ	10 ⁻⁶ ("micro")	✓	
°	degree (for temperature)		✓
§	Section	✓	
—	em dash		✓
-	en dash		✓
:	ratio; proportionality		✓
\$	U.S. dollar		✓
/	Per	✓	
%	Percent	✓	

Note: When using mathematical and other signs and symbols in text (as opposed to in tables or table footnotes), use words for the quantitative relationships indicated in Table 6-1.

Example:

Correct	Incorrect
When installing culvert pipe <i>less than or equal to</i> 48 inches in diameter...	When installing culvert pipe \leq 48 inches in diameter...
When the centerline curve radius is <i>greater than</i> 500 feet...	When the centerline curve radius is $>$ 500 feet...

Use a colon for slope notation (vertical : horizontal). For slopes flatter than 1V:1H, express the slope as the ratio of one unit vertical to a number of units horizontal. For slopes steeper than 1V:1H, express the slope as the ratio of a number of units vertical to one unit horizontal.

6.5 RANGES

A range is defined by two endpoints. The endpoints may be inside and part of the range, or outside and excluded from the range.

Whether in text or in tables, when defining a series of related ranges that together describe a complete set of possibilities, ensure that no number or measurement can fall in more than one range. That is, make the ranges mutually exclusive.

Example: One large range (0 to 750 millimeters) is divided into three mutually exclusive ranges by two internal endpoints (250 and 500 millimeters) that fall into the first and second ranges, respectively, and cannot fall elsewhere.

Correct: From 0 to 250 millimeters; over 250 to 500 millimeters; and over 500 to 750 millimeters.

Incorrect: From 0 to 250 millimeters; 250 to 500 millimeters; and 500 to 750 millimeters.

Ranges in Text

In text, indicate a range that includes the endpoints by using the words *from* and *to*. The words *inclusive* or *minimum* and *maximum* may be added as appropriate to enhance clarity. Do not use a dash to indicate a range (–), as this can too easily be confused with a minus sign.

Indicate a range from which the endpoints are to be excluded by using the words *between* and *and*. Most such ranges will be defined by discrete physical objects or boundaries, rather than by numeric measurements.

Avoid using *between* and *and* with measurements because this wording leads to uncertainty over how close the range should approach the endpoints. *Between 25 °C and 30 °C*, for example, could mean from 26 °C to 29 °C, or it could mean from 25.1 °C to 29.9 °C — the wording is uncertain.

Examples:

Provide an accurate and calibrated thermometer having a range from 200 to 600°F in 5 °F graduations.

Limit joint widths from 1 inch minimum to 2 inches maximum.

Take roadway cross-section data between the centerline and the new slope stake location.

Ranges in Tables

As best warranted to ensure clarity, ranges may be described in tables using symbols only, words only, or with both words and symbols. However defined, do not create adjoining ranges with shared endpoints.

Table 6-2 compares the use of these three methods to divide a range from 0 to 100, inclusive, into four contiguous smaller ranges.

**Table 6-2
Displaying Ranges in Tables**

Symbols only	Symbols and words combined	Words only
≤ 25	≤ 25	25 or less
$>25 - 50$	>25 to 50	over 25 to 50
$>50 - 75$	>50 to 75	over 50 to 75
$>75 - 100$	>75 to 100	over 75 to 100

6.6 MINIMUM, MAXIMUM, MINUTES

In text, spell out the words *minimum* and *maximum* in full or use alternatives such as *at least* or *no more than*.

Examples:

The minimum number required to perform a statistical evaluation is 3.

The maximum obtainable pay factor with 3, 4, or 5 samples is 1.01.

In tables or lists, minimum and maximum values may be indicated by using their abbreviated forms (min. and max.). In some cases, the better alternative would be to use the symbol (\geq) to indicate a minimum and (\leq) to indicate a maximum. This would help prevent confusion between the abbreviation for a minimum value (min.) from the measurement symbol for minutes (min).

Example:

Ductility, 25 °C, 50 mm/min, AASHTO T 51 40 mm min.

Or better:

Ductility, 25 °C, 50 mm/min, AASHTO T 51 \geq 40 mm

