

## Chapter 2 UNITS OF MEASURE

### 2.1 Abbreviations

Listed below are selected abbreviations used in the Basis of Estimates. For a more complete list of abbreviations, refer to the [Standard Plans](#).

*NOTE: Pay item descriptions shown on various reports may be abbreviated as needed to fit “long” and “short” description fields of 80 and 40 characters, respectively. While every effort is made to be consistent, the abbreviated descriptions may vary from those shown on the Standard Plans.*

Abbreviation	Unit of Measure	Precision
AC	Acre	0.01
AS	Assembly <sup>1</sup>	1
BF	Board Feet <sup>3</sup>	1
CF	Cubic Foot	0.1
CY	Cubic Yard	0.1
DA	Day	1
EA	Each	1
ED	Each Day	1
FD	Feet·Day	1
GA	Gallon	1
GM	Gross Mile	0.001
HR	Hour	1
LB	Pound	1
LF	Linear Foot	1
LO	Location	1
LS	Lump Sum	1
LU	Luminaire <sup>1</sup>	1
MB	Board Measure/ Thousand Feet	0.1
MG	Thousand Gallons <sup>3</sup>	1
MH	Man-hour <sup>2</sup>	1
MI	Mile	0.001
MO	Month <sup>3</sup>	1
NM	Net Mile <sup>3, 4</sup>	.001
PI	Per Intersection <sup>1</sup>	1
PM	Per Mile <sup>3, 4</sup>	1
PS	Per Set <sup>1</sup>	1
SF	Square Foot	1

SY	Square Yard	1
TN	Ton	0.1

<sup>1</sup> Units which will be replaced with unit of Each (EA) upon pay item/specification update. See details below.

<sup>2</sup> Units will be replaced with Hour (HR), upon pay item/specification update. See details below.

<sup>3</sup> Unit used by Maintenance pay items only

<sup>4</sup> Unit will be replaced with Mile (MI), upon pay item/specification update.

Per Item versus Each: Units of measure previously identified as assembly, luminaire, plant, or other will be changed to EA, as specifications are revised. The item's description should indicate the item to be measured with the EA unit of measure.

## 2.2 Secondary Units

Secondary Units apply to Lump Sum (LS) pay items. When a lump sum pay item has secondary units other than lump sum (LS/LS), the designer must enter the estimated secondary quantity into the Designer Interface. Estimating reports will show the secondary units for estimating purposes. The Project Summary, Proposal Summary, and other bid document reports will show the LS units with a quantity of 1.

Example: 102-1-1 Maintenance of Traffic, LS/DA has a secondary unit of days. After the designer enters the number of MOT days for that project number, estimating reports will show the number of days while the Proposal Summary of Quantities will show 1 LS.

For Lump Sum items with a secondary unit of Lump Sum (LS/LS), partial payments will be made based on the percentage completed, per Section 9 of the specifications. Percentage will be rounded to 2 decimal places (0.01 of the total quantity of 1).

Additional guidance for pay items with secondary units may be included with the pay item number details. Refer to BOE Chapter 9 for guidance on Supplementary Descriptions. Refer to Chapter 8 for guidance on documenting work and materials for Lump Sum items. NOTE: Lump Sum pay items are NOT PERMITTED on Push Button/Work Document Contracts. Additional details are included in Chapters 6 and 10.

## 2.3 Precision and Rounding

Precision is noted on the abbreviations table above. Calculations are performed with one additional significant figure, and then rounded to the above precision for measurement/payment.

As a quick guide, all units are paid to the nearest whole number, except for:

0.1: Cubic Yard, Cubic Foot, Tons, MB lumber

0.01: Acre

0.001: Gross Mile Stripe

Rounding shall be completed in accordance with the common rule: If the number you are rounding is followed by 5, 6, 7, 8, or 9, round the number up. If the number you are rounding is followed by 1, 2, 3, or 4, round the number down. DO NOT use “up rounding”, which will always round up the next value. For example: A calculated total of 132.3 ft should be shown as 132 ft, and NOT up rounded to 133 ft.

## Chapter 2 Revision History

**11-1-20:** Updated header dates for 2020 edition. Added 2.3 heading for secondary units. Added FD Feet·Day, BF Board Feet, MG Thousand Gallons, MO Month, NM Net Mile, and PM Per Mile units of measure.

**11-1-19:** Updated header dates for 2020 edition. Removed old footnote for Mile (MI) units. Updated 2.1 guidance for Lump Sum pay items.

**11-1-18:** Updated header dates for 2019 edition. Deleted 2.3 metric conversion factors. Added note for item vs. each.

**10-23-17:** Updated header dates for 2018 edition. Added reference to Chapter 9 for Supplemental Description used with Lump Sum items.

**6-22-17:** Added LS/LS information for rounding partial payment percentage, per Final Estimates- Construction Office request.

**10-25-16:** Updated header dates for 2017 edition. Added abbreviations and rounding information. Removed discontinued section 2.4 Accuracy/Precision information updated in 2.1 and 2.2.

**3-14-16:** Added information for secondary units to 2.1.

**2-1-16:** Added note for removal of alphabetical list.

**11-25-15:** Updated header dates for 2015 edition. Corrected AC unit of measure to 1/100 AC.

**12-30-14:** Updated header dates for 2015 edition. Added end date to PM unit; refer to Rumble Strip pay items for details.

**2-27-14:** Removed units for Clean-out (CO), Bushel (BU), Dollars per Day (DD), Luminaire (LU).

**12-2-13:** Updated header dates for 2014 edition. Added note to 2.1 to indicate that abbreviated text for pay item descriptions may vary from with Design Standards. Moved Alphabetical list from Chapter 3 to 2.4.

**2-20-13:** Updated header dates for 2013 edition.

**11-23-11:** Updated header dates for 2012 edition.

**12-1-10:** Updated header dates for 2011 edition.

**10-30-09:** Updated header dates for 2010 edition.

**1-28-09:** Added 2.2 Accuracy. Renumbered 2.3 Conversion Factors.

**10-1-08:** Updated header dates for 2009 edition.