

AASHTO Publications

*Style Manual
and
Process Guide*

2019

3rd Edition

AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
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Preface

The *AASHTO Publications Style Manual and Process Guide* was created to assist the many committee volunteers, vendors, consultants, and internal staff in providing, editing, formatting, and preparing content for AASHTO publications. It provides information for authors, editors, and designers about AASHTO design preferences, style and editorial rules, and print and digital publication guidelines.

Like all AASHTO digital publications, this guide includes many features to aid users to quickly navigate to the specific information sought: bookmarks; fully linked table of contents, list of figures, and list of tables; and internal links and weblinks in the running text. Also included are annexes with resources for different users:

- [**Annex A: Author/Committee Resources**](#)
- [**Annex B: Editorial Resources**](#)
- [**Annex C: Design Resource**](#)
- [**Annex D: Administrative Resource**](#)

This guide is meant to be used as a desk reference. It is our hope in offering this reference to volunteers, staff who liaise with them, vendors, and consultants early in the content development and production processes that we can continue to provide timely, accurate, and high-quality publications to our readership.

—AASHTO Publications Staff

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Part 1: Author/ Committee



Chapter 1

Author/Committee Workflow

1.1 Content Development

Begin using this style manual and process guide as early as possible in development of any content (e.g. text, figures, tables, equations) destined to become a new AASHTO publication, or to be incorporated into an existing one. In addition to this chapter, refer to

- [Chapter 2, “Providing Content,”](#)
- [Part 3, “Style Rules,”](#) and
- [Annex A, “Author/Committee Resources.”](#)

1.2 Obtaining Permissions

Obtain written permission (emails are acceptable) to use any material that is derived from a copyrighted source. Be sure to include source information for this content. See [Annex A1, “Request for Permission to Publish.”](#)

1.3 Committee Approval

Most AASHTO publications are balloted and approved by a committee or task force before AASHTO Publications begins production. This is not always possible but it is the ideal situation; it ensures that the latest, authorized versions of the files are used.

1.4 Handoff to Production

1.4.1 Files and Information Needed at Handoff

Please submit documents in Word format. Submit the text and graphic files as separate, individual components rather than integrated in one single file.

When the content is ready for handoff, AASHTO Publications will need

- confirmation of the final title,
- main text,
- front matter,
- end matter,
- reference list, and
- graphics.

In addition, you will likely be asked for

- a completed copy of the AASHTO Technical Publications Promotional Information Form, found in [Annex A3](#), and
- cover graphics.

For the full details of what is needed at handoff, see [Annex A2, “AASHTO Technical Publications Checklist.”](#)

1.4.2 File Delivery Methods

File delivery method varies by committee. Web portal, DropBox, and FTP are all acceptable methods. Email is also acceptable for smaller files.

1.5 Technical Review

1.5.1 Reviewers

Members of the committee or task force responsible for the publication are the technical reviewers who are responsible for the technical accuracy of the document.

The Committee on Bridges and Structures (CBS) and the Committee on Materials and Pavements (COMP) use technical subcommittees to oversee specifications pertaining to specific subjects; for example, the technical subcommittees for COMP focus on different types of construction materials—asphalts, bituminous material, hydraulic cement, pipe, etc. (The LRFD books are the exception to this rule. One consultant group, Modjeski and Masters, is the sole author of this series under the auspices of CBS.) The technical subcommittee chairs serve as the contact persons during the technical review process.

The remaining committees designate members to serve as chapter authors, who act as the contact persons for individual chapters during the technical review. For small publications, only one person will act as the technical reviewer. This person is usually the chair or secretary of the committee or task force responsible for the publication.

1.5.2 Schedule

The schedule for technical review varies depending on the size of the project. A small publication may be reviewed in a week or less. Large publications may require up to a month to complete the review process.

1.5.3 File Transfer

The AASHTO project manager sends the electronic document to the AASHTO liaison or to the designated committee chair, task force chair, or chapter author for review. The email to the reviewer should include

- file retrieval instructions or the formatted document attachment(s),
- the deadline for return of the technical review comments, and
- a list of queries to the technical reviewers.

1.5.4 Reviewer Content Check

Reviewers should determine that all content is complete, correct, and presented in a logical order. Make sure that no content has been inadvertently dropped and no errors have been inadvertently introduced. Check (or at least spot check)

- text,
- figures,
- tables,
- equations,

- references, and
- keywords.

1.5.5 Query Responses

Answer all technical queries, which are listed in a separate document. See [Annex B4, “Query Form,”](#) for an example of what to expect.

If there are any outstanding figure issues related to missing files, image credits, or copyright permissions, provide the files as needed and the contact information to enable AASHTO Publications to follow up with the content owner. See [Annex B5, “New and Revised Figure Worksheet.”](#)

1.6 Final File Availability

Final files will be made available after the document has been published to ensure that any late-stage edits are captured for future content revisions.

Chapter 2: Providing Content

2.1 Figures and Other Graphics

2.1.1 General

In AAHTO publications, line art is of two types:

- graphs and charts, or
- diagrams and drawings.

Bar graphs, line graphs, and pie charts are used to show relationships among data. Diagrams show relationships among components, while drawings (or illustrations) show the essential elements of an object but may omit unnecessary details.

2.1.2 Software

AASHTO uses two basic graphics programs to create line art illustrations—Adobe Illustrator and Adobe Photoshop. (Please note that AASHTO Publications staff do not have access to AutoCAD.) All line art drawings must be compatible with one of these programs and should have a minimum of 0.35-point line weight. Please submit these graphics as EPS, TIFF, or JPEG files. If you use MicroStation drawings, please submit them as exported EPS files.

Line art charts or graphs may be created in Word or Adobe Illustrator or generated from Excel files. The charts or graphs should be easily understood and the main idea visually obvious to the reader. Avoid designs using complex color schemes or subtle color coding for data. Make sure all symbols are easily recognizable.

2.1.3 Placeholder Images and Separate Files

Figures should be inserted in Word documents as “pictures,” not as “drawing objects.” The file should be inserted in a paragraph style tag named “Figure Placeholder” that is immediately followed by a paragraph style tag named “Figure Caption.” Use the “Keep with next” style feature with the Figure Placeholder tag so that the picture does not get separated from its caption.

All figures must be submitted as separate graphic files even if you have inserted them in a Word document.

2.1.4 Figure Captions

2.1.4.1 Wording

The figure caption should clearly distinguish its figure from other illustrations. The caption should provide a succinct noun or noun phrase that describes the figure but does not provide unnecessary background information nor repeat information found in the text. Any lengthier description should be included as a figure note rather than as part of the figure caption itself. Other guidelines are as follows:

- Avoid using articles, such as, “A,” “The,” etc., at the beginning of captions.

- Capitalize both parts of hyphenated terms within the figure caption if the elements are nouns or adjectives or if the element is the final word of the caption. Correct examples would be “State-of-the-Art Report”; “Four-Leg Intersection”; “Conditions Determined to Be Pre-Existing.”
- Do not abbreviate “Figure.”

2.1.4.2 Position

Figure captions should appear below the figure. Use a period between the figure number and the caption of the figure, but not at the end of the figure caption. Figure captions are set in “Title” case, i.e., all nouns and verbs are capitalized while all conjunctions, prepositions, and articles are lowercase. Figure captions should be formatted consistently throughout the text.

2.1.4.3 Font

Figure captions may be set in serif or sans serif fonts. (Times New Roman or Arial fonts are preferred because they are commonly used.) Figure captions are usually set in boldface type.

For a discussion of fonts used within the figures themselves, see [Section 2.1.2](#).

2.1.4.4 Numbering

All figures should be numbered with Arabic numerals. Depending on the publication, numbering may be sequential, by chapter, or by section. Figures, tables, and equations should all be numbered separately, but the same numbering convention should be used for each.

Small publications often use sequential numbering (e.g. “Figure 1,” “Figure 2”).

Larger publications may use chapter numbering, where each figure is numbered with the chapter number followed by a hyphen and then followed by the number of the figure within that chapter (e.g., “Figure 7-1,” “Figure 7-2”). Numbering restarts from “-1” at the beginning of each chapter.

As an alternative to chapter numbering, large publications may instead use section numbering, where each figure is numbered with the lowest level section heading preceding the figure followed by a hyphen and then followed by the number of the figure within that section (e.g., “Figure 2.3.5.7-1,” “Figure 2.3.5.7-2”). Numbering restarts from “-1” with each new heading. This guide provides an example of section numbering (see [List of Figures](#)).

When chapter or section numbering is used, callouts should always use the full figure number.

2.1.5 Photographs

2.1.5.1 General

Photographs show exactly how something looks to help readers recognize an object, design, or situation. Photographs should support the information given in the text of the document. Photographs shall be considered figures in the document and will be numbered and titled accordingly. Additional guidelines are as follows:

- Color photos are preferred but black-and-white photos are acceptable.
- In the case of photographs of equipment, the photograph should not show a manufacturer’s name or logo on the equipment.
- Photographs that are not purchased as stock photography must be accompanied by the Photo Release Form and, if identifiable people are in the picture, a Model Release Form for each person.
- Digital photographs should be submitted where possible. If digital photographs are unavailable, hardcopy photographs are preferred to scanned images.

- Hardcopy art and photographs will not be returned after publication of the document unless requested by the author.

2.1.5.2 Digital Photographs

Send the highest resolution photographs that your digital camera can provide. Remember that we can always reduce the size of a photo, but we can never really improve the original resolution of a photo. TIFF or high-resolution jpg files are preferred.

Digital images must be at least 300 dpi in order to print properly; 600 dpi is preferred. At this resolution, an 8- by 10-in. photo would be approximately 7.2 MB and a 4- by 6-in. photo would be 2.6 MB.

Always save your digital photographs in a separate folder. Always submit these separate graphic files along with your document files.

For any photo figure that includes labels, two files should be submitted:

- a low-resolution version for label content and placement, and
- a high-resolution photo without the labels.

This way, text can be made consistent in size, font, and style with other figures in the publication.

If you wish to show the position of the photograph in the document, place a copy of the photograph in the Word document.

2.1.5.3 Hardcopy Photographs

Send the original photograph. Photographs not submitted electronically should be glossy prints that are sharp with good contrast. They should not be bent or scratched.

Photographs cut out of previous publications cannot be used.

2.1.5.4 Scanned Photographs

Black-and-white photos should be scanned in grayscale mode at a minimum of 300 dpi. Do not use halftone mode. Scan with software enhancements such as sharpening and descreening turned off.

2.1.5.5 Helpful Photo-Taking Tips

When taking photos for an AASHTO publication, keep these tips in mind:

- If the photograph is of a single piece of equipment, shoot the photo indoors (if possible) using a white background (or one that will enhance contrast).
- Make sure the lighting is adequate.
- If the photograph is taken outdoors, make sure that the sun is behind you.

2.1.6 Line Art

2.1.6.1 Purpose

Line art may consist of illustrations, diagrams, charts, and graphs). Line art diagrams use symbols labeled to represent system components and links that show the relationship among them. Line art illustrations show specific features of an object or show how something works, is assembled, or is maintained. Pie charts, bar graphs, line graphs, or scatter charts are used to illustrate changes or trends over a period of time, to show patterns in numerical data, or to show relationships among various factors.

2.1.6.2 Examples

Examples of acceptable line art are as shown in **Figures 2.1.6.2-1** through **2.1.6.2-7**.

Port and Terminal—Forecast Capacity/Demand
(Millions of Twenty-Foot Equivalent Container Units)

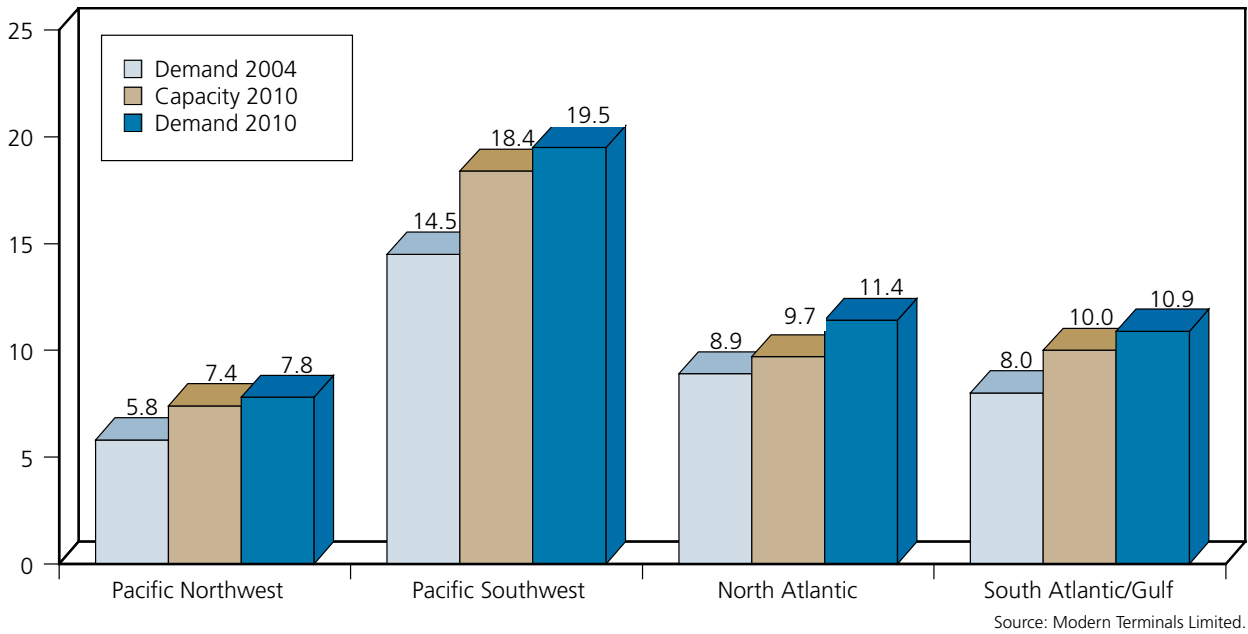
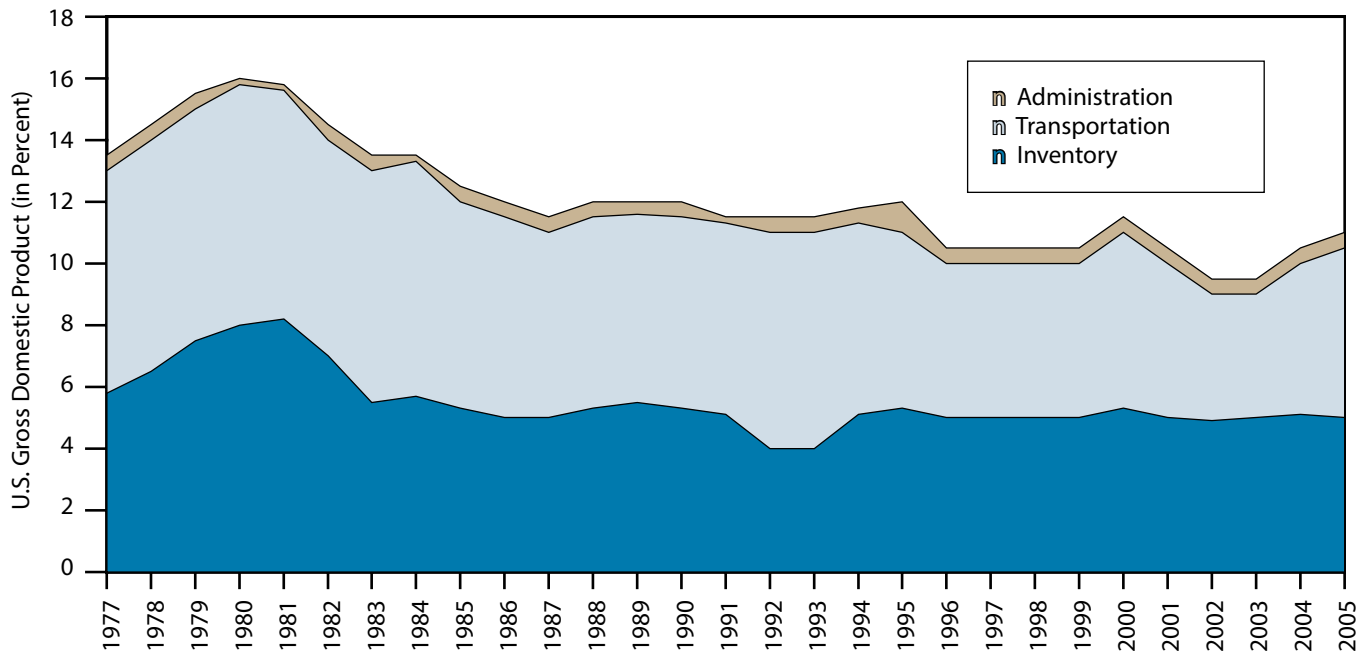


Figure 2.1.6.2-1. Bar Graph Example (Port and Terminal—Forecast Capacity/Demand)



Source: Rosalyn A. Wilson, State of Logistics Report, Council of Logistics Management, 2006.

Figure 2.1.6.2-2. Line Graph Color Example (Logistics as Percent of GDP)

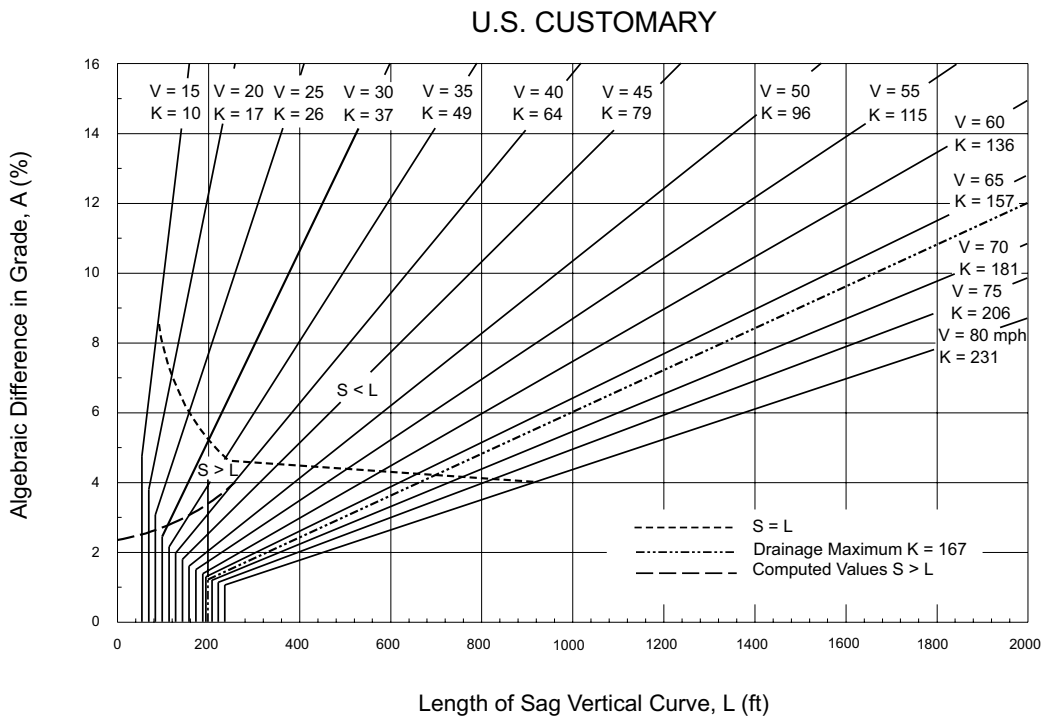
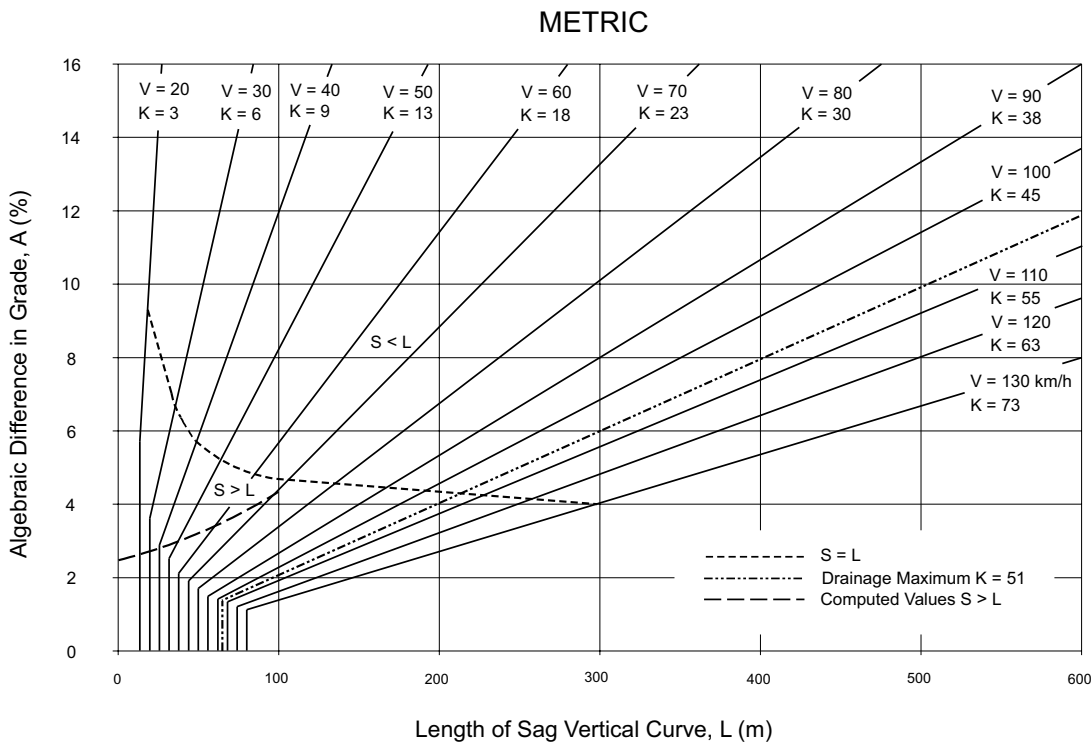


Figure 2.1.6.2-3. Line Graph Black and White Example (Design Controls for Sag Vertical Curves—Open Road Conditions)

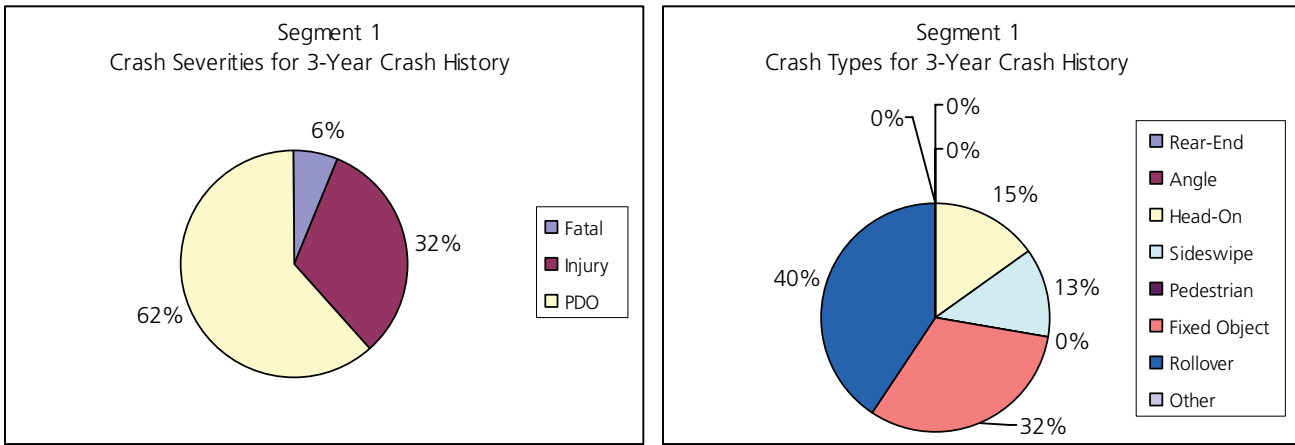


Figure 2.1.6.2-4. Pie Chart Example (Crash Summary Statistics for Segment 1)

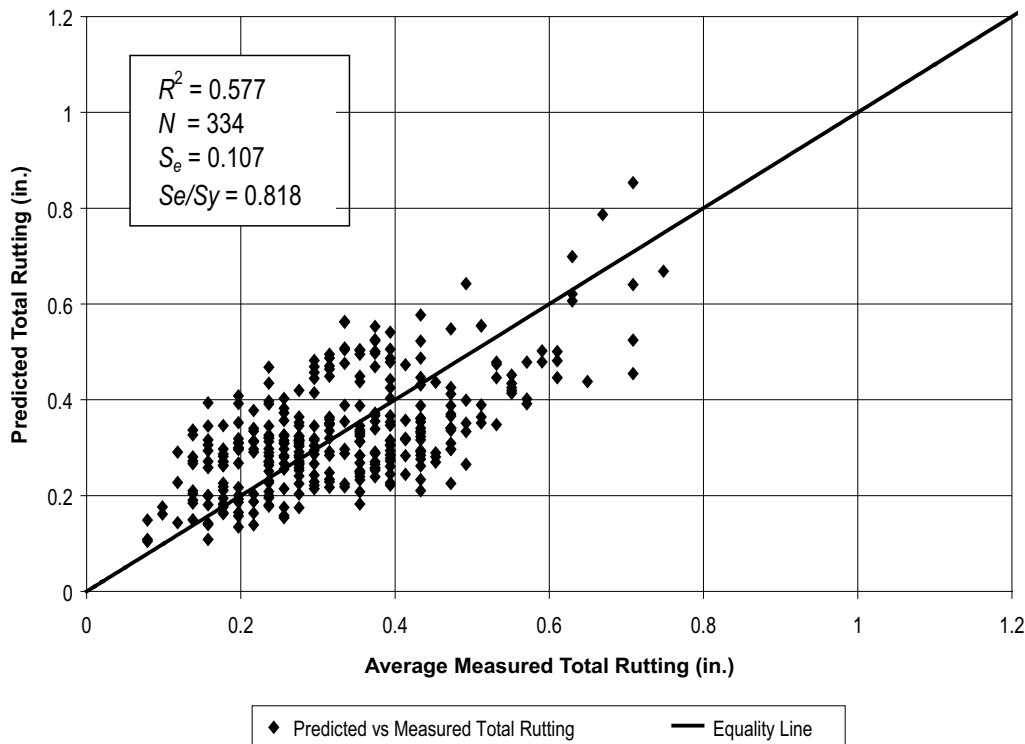


Figure 2.1.6.2-5. Scatter Chart Example (Comparison of Measured and Predicted Total Rutting Resulting from Global Calibration Process)

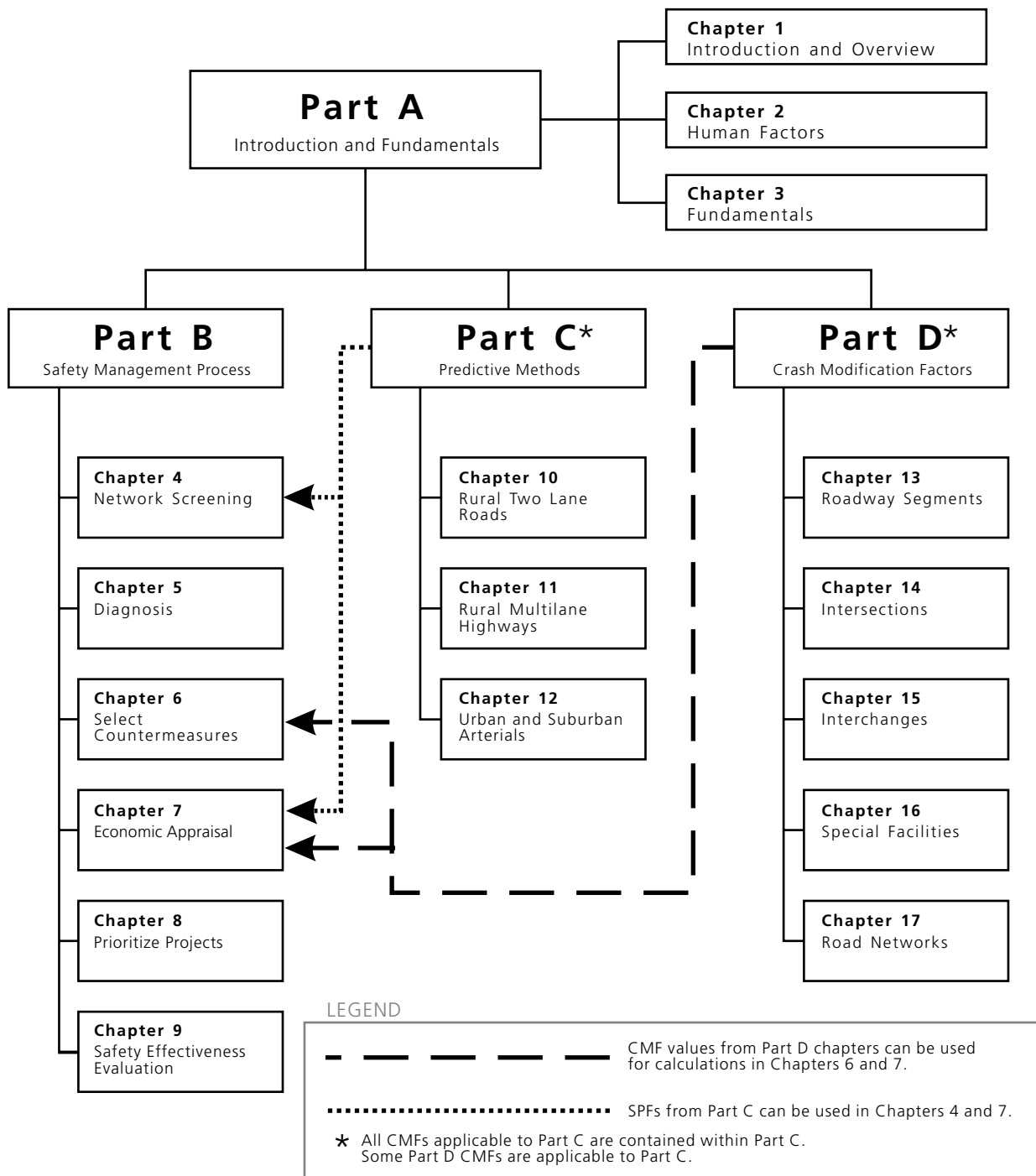


Figure 2.1.6.2-6. Diagram Example (Organization of the *Highway Safety Manual*)

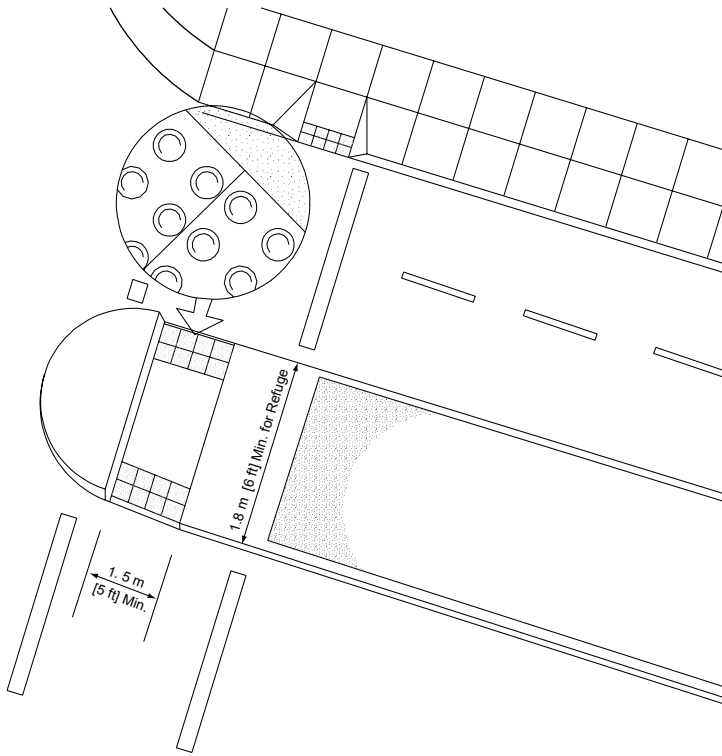


Figure 2.1.6.2-7. Illustration Example (Median Refuge)

2.1.6.3 Color vs. Black and White

In digital-only publications, use of color where appropriate is preferred. In publications that will be printed, line art should be black-and-white. Fills, such as cross-hatching and patterned lines, or screens may be used as substitutes for color in publications that will be printed.

2.1.6.4 File Formats

Line art may be submitted as Adobe Illustrator files or submitted as an export to EPS format. Graphs and charts must be in a format editable in Word or Adobe Illustrator. Figures should be able to fit within an 8½-in. by 11-in. page, or constructed in such a way that they may be broken apart for placement on several 8½-in. by 11-in. pages.

2.1.6.5 Scanned Line Drawings

If hardcopy artwork must be scanned, the original drawings must have sharp, uniformly black lines. Images with fuzzy or broken lines, smudges, poor contrasts, delicate lines or fills, and stray marks or un-contained fills are not acceptable.

2.1.6.6 Figure Text

Make all fonts, symbols, abbreviations, dimension lines, text, fills, and line weights consistent for all line art of the same project, even if different software is used to produce individual graphics for the line art. For example, the same font in the same size should be used for all text or dimensions. Similarly, the dimensions should be indicated in the same manner, i.e., end lines or arrows, in all of the illustrations for the same project. Do not mix the use of decimals and fractions. Fractions should be presented in the same way— $\frac{1}{2}$ or $\frac{1}{2}$ —not in a combination of ways, e.g., some using diagonal slashes and some with numerator directly over the denominator, or some as fractions and others as decimals.

Abbreviations and symbols must not only be consistent throughout the book, but must also be of an ASCII format that will not change if the graphic is converted to a PDF.

2.1.6.7 Lines, Shading, and Fills

Because hairline weights will not print properly, lines must be at least 0.35 point thick. Similarly, shading and fills must be dark enough that they do not fade or disappear when printed.

2.1.6.8 Example of Figure Design Instructions

As an example, instructions for the design of the Green Book figures are shown in [Table 2.1.6.8-1](#).

2.1.7 Figure Footnotes

Footnotes are normally set one size smaller than the figure caption text (e.g., 9 points if the figure caption text is 10 points). The words “Source” and “Notes” are traditionally distinguished typographically from the note that follows.

In “Source:” or “Note:” do not italicize the punctuation (:). Make terms italic and initial caps followed by lowercase running text in roman style font.

Table 2.1.6.8-1. Green Book Figure Design Instructions

Font	Arial
Size	Headings—10 points Text—8 points
Style	Level 1 heading should be ALL CAPS; Level 2 heading should be Title Case. “Notes” should be removed from figures unless the note accompanies only a specific section of the figure.
Dimensions	Center dimension measurements within the dimension lines if the space is adequate. Use arrowheads instead of dots or slashes as the terminators. Use extension lines for clarity as necessary.
Fractions	Express fractions with diagonal slash for U.S. Customary Units and as decimals for Metric Units.
Abbreviations	Use “in.” and “ft” not ‘ or ” for U.S. Customary Units. Include periods for “U.S.” in U.S. Customary Units. If “Max” or “Min” appears in metric units, then it must also appear in U.S. Customary units if they are written separately. For example, both “14.58 m Max [47.8 ft Max]” and “14.58 [47.8 ft] Max” are correct; “14.58 m Max [47.8 ft]” is incorrect.
Symbols	ASCII Use “Diameter” instead of \varnothing ; also spell out “Radius.” Use en dash (–) as minus sign. Use \times instead of x for multiplication symbol.
Line Weights	Minimum 0.35 point.
Fills	Use ISO industry standard fills. Fills or shading must be dark enough that they will print well.

Footnotes to a figure are of four general kinds and should appear in this order: (1) source notes, (2) other general notes, (3) notes on specific parts of the figure, and (4) notes on the level of probability. Leave extra space in between each note item.

2.1.8 Figures Continued on More Than One Page

Use continued lines as needed. Format in italics as follows:

- “Continued on next page” should appear under the figure caption at the bottom of the page.
- “Figure #—Continued ” should appear below the figure on the next page.

Alternately, when all parts of a large figure don’t fit on one page, consider numbering them as separate figures.

2.2 Tables

2.2.1 Purpose

Tables are used to present a large amount of detailed information in a minimum amount of space or to present quantitative or precise numerical values in a concise manner. Table and caption formatting should be consistent through the entirety of a publication.

2.2.2 In Word

In a Word document, the table itself should be inserted in a paragraph style tag named “Table Placeholder” that immediately follows a paragraph style tag named “Table Caption.” The Table Caption tag should utilize the “Keep with next” feature in order to avoid separation between the table caption and the table.

Avoid fills or shading in table cells. If gray shading is necessary to clarify the intended meaning, use a solid “Fill” of 20 percent gray.

2.2.3 Table Captions

2.2.3.1 Wording

The table caption should clearly distinguish its figure from other illustrations. The caption should provide a succinct noun or noun phrase that describes the table, but does not provide unnecessary background information nor repeat information found in the text. Any lengthier description should be included as a table note rather than as part of the table caption itself.

Avoid using articles, such as, “A,” “The,” etc., at the beginning of captions.

Capitalize both parts of hyphenated terms within the table caption if the elements are nouns or adjectives or if the element is the final word of the caption. Correct examples would be “State-of-the-Art Report”; “Four-Leg Intersection”; “Conditions Determined to Be Pre-Existing.”

Do not abbreviate “Table.”

2.2.3.2 Position

Table captions should appear above the table. Use a period between the table number and the caption of the table, but not at the end of the table caption. Table captions are set in “Title” case, i.e., all nouns and verbs are capitalized while all conjunctions, prepositions, and articles are lowercase. Table captions should be formatted consistently throughout the text.

2.2.3.3 Font

Table captions may be set in serif or sans serif fonts. (Times New Roman or Arial fonts are preferred because they are commonly used.) Table captions are usually set in boldface type.

2.2.3.4 Numbering

All tables should be numbered with Arabic numerals. Depending on the publication, numbering may be sequential, by chapter, or by section. Figures, tables, and equations should all be numbered separately, but the same numbering convention should be used for each.

Small publications often use sequential numbering (i.e., “Table 1,” “Table 2,” etc.).

Larger publications may use chapter numbering, where each table is numbered with the chapter number followed by a hyphen and then followed by the number of the table within that chapter (e.g., “Table 7-1,” “Table 7-2,” etc.). Numbering restarts from “-1” at the beginning of each chapter.

As an alternative to chapter numbering, large publications may instead use section numbering, where each figure is numbered with the lowest level section heading preceding the table followed by a hyphen and then followed by the number of the figure within that section (e.g., “Table 2.3.5.7-1,” “Table 2.3.5.7-2,” etc.). Numbering restarts from “-1” with each new heading.

When chapter or section numbering is used, callouts should always use the full table number.

2.2.4 Table Format

2.2.4.1 Table Orientation

Set all tables vertically (portrait) if possible.

2.2.4.2 Table Margins

Make sure the tables do not exceed the limits imposed by the printed page.

2.2.4.3 Table Rules

Make rules at the top and bottom of the table one point wide. All other rules should be 0.5-point wide.

2.2.4.4 Table Headings

Table headings—i.e., column heads, spanners, and cut-in heads—can be set in Times New Roman or Arial, 8–10 points (7 points can be used if space must be conserved), boldface. Spanners are set above column heads and cover two or more column heads. Cut-in heads are set below column heads, cover two or more column heads, and function as spanner subheads. Spanner heads and cut-ins must be centered over the columns they apply to.

When tabular matter demands two or more levels of headings, decked heads must be used. A decked head consists of a spanner head and two or more column heads to which it applies. A horizontal rule is set between the spanner and column heads indicating the columns the spanner applies to. Decked heads should seldom exceed two levels. See [Figures 2.2.4.10-1](#) through [2.2.4.10-3](#) for examples.

2.2.4.5 Table Stub

The table stub is the far left column of the table that lists the items about which information is provided in the columns to the right. Use Times New Roman, 8–10 point, initial caps for the stub row text. Headings in the table stub are set as other headings are.

In the stub, subheads should be in italics and are aligned flush left. Stub items are usually indented one em space under the subhead. Runovers in stub items are indented one em space from where the item begins.

With two or more levels of subheads in the stub, the top level may be centered and the second level flush left. Use cut-in heads for the top-level subheads with rules above and below extending all the way across the table.

2.2.4.6 Table Columns

Vertically align a column of figures on the decimal points. Numerals of 1,000 or more should have commas for U.S. Standard units only; SI units of 10 000 or more should have a nonbreaking space inserted in place of the comma while SI units between 1000 and 9999 do not have a comma or spacing. Mathematical operation signs are aligned if they precede quantities in a column of figures. In a column consisting of information expressed in words, make text flush left if the description is long. If short, center it.

2.2.4.7 Table Symbols

In table text:

- Use em dashes to indicate breaks.
- Use en dashes to indicate ranges (2–4).
- Use “%” to indicate percentages.
- For equations, use a minus sign (en dash) with a space on either side.

2.2.4.8 Table Footnotes

Footnotes are normally set one size smaller than the body of a table (e.g., 7 points if the table text is 8 points). The words “Source” and “Notes” are traditionally distinguished typographically from the note that follows.

In “Source:” or “Note:” do not italicize the punctuation (:). Make terms italic and initial caps followed by lowercase running text in roman style font.

Footnotes to a table are of four general kinds and should appear in this order: (1) source notes, (2) other general notes, (3) notes on specific parts of the table, and (4) notes on the level of probability. Leave extra space in between each note item.

2.2.4.9 Tables Continued on More Than One Page

Use continued lines as needed. Format in italics as follows:

- “Continued on next page” should appear under the rule of the table at the bottom of the page.
- “Table #—Continued ” should appear above the top rule of the table on the next page.

Column heads are to be repeated on each page, but the title of the table is not.

2.2.4.10 Sample Tables

The examples in [Figures 2.2.4.10-1](#) through [2.2.4.10-3](#) are tables taken from AASHTO’s LRFD Design, Materials Standards, and Green Book.

Table 4.6.2.2.1-2— L for Use in Live Load Distribution Factor Equations

Force Effect	L (ft)
Positive Moment	The length of the span for which moment is being calculated
Negative Moment—Near interior supports of continuous spans from point of contraflexure to point of contraflexure under a uniform load on all spans	The average length of the two adjacent spans
Negative Moment—Other than near interior supports of continuous spans	The length of the span for which moment is being calculated
Shear	The length of the span for which shear is being calculated
Exterior Reaction	The length of the exterior span
Interior Reaction of Continuous Span	The average length of the two adjacent spans

Figure 2.2.4.10-1. LRFD Design Table Format Example

Table 2.2.5-1—Weight of Metallic Coating Type I or II Fabric

Specified Diameter of Coated Wire		Weight of Coating of Uncoated Wire Surface ^a		
		Type I Zinc		Type II Aluminum,
in.	mm	Class C, oz/ft ²	Class D, oz/ft ²	oz/ft ²
0.192	6	1.2	2.0	0.40
1.148	9	1.2	2.0	0.40
0.120	11	1.2	2.0	0.35

^a Based on ASTM A309.

Figure 2.2.4.10-2. Materials Standards Table Format Example

Table 2-1. Corresponding Design Speeds in Metric and U.S. Customary Units

U.S. Customary	Metric
Corresponding Design Speed (mph)	Design Speed (km/h)
15	20
20	30
25	40
30	50
40	60
45	70
50	80
55	90
60	100
70	110
75	120
80	130
85	140

Figure 2.2.4.10-3. Green Book Table Format Example

2.3 Equations

2.3.1 Numbering

All equations should be numbered with Arabic numerals. Depending on the publication, numbering may be sequential, by chapter, or by section. Equations, figures, and tables should all be numbered separately, but the same numbering convention should be used for each.

Small publications often use sequential numbering (i.e., “Equation 1,” “Equation 2,” etc.).

Larger publications may use chapter numbering, where each equation is numbered with the chapter number followed by a hyphen and then followed by the number of the equation within that chapter (e.g., “Equation 3-1,” “Equation 3-2,” etc.). Numbering restarts from “-1” at the beginning of each chapter.

As an alternative to chapter numbering, large publications may instead use section numbering, where each equation is numbered with the lowest level section heading preceding the equation followed by a hyphen and then followed by the number of the equation within that section (e.g., “Equation 4.8.1-1,” “Equation 4.8.1-2,” etc.). Numbering restarts from “-1” with each new heading.

Equation numbers are enclosed in parentheses at the right-hand margin (note that, as in the examples above, parentheses are not used when referring to the equation in the publication’s text). The word “Equation” does not precede these numbers. There should be a minimum of one quarter of an inch between the equation number and the last term in the equation. For example

$$H_{int-t} = \frac{s_w - \frac{w_t}{12} - \frac{0.06D_i}{12}}{LLDF} \quad (3.6.1.2.6b-1)$$

The equation number appears on the same line of a single-line equation and on the last line of a multiline equation.

2.3.2 Software

Equations should be formatted in MathType, which works standalone or as a Word plugin. MathType is available for download at <https://docs.wiris.com/en/mathtype/start>. This site also has documentation for use of the software.

2.3.3 Key Formatting

All variables represented by Roman letters are italicized throughout the text. Variables represented by Greek symbols are not italicized.

Fences/enclosures are used in the preferred order listed in The Chicago Manual of Style, working from parentheses outward: { [()] }.

For more information about formatting equations and other mathematical expressions, see [Section 9.5](#).

2.4 Hyperlinks

If hyperlinks (weblinks) are included in the main text or the references:

- provide an upper-level link that is less likely to be broken over the life of the publication; and
- test that the links work before handing off the files.

2.5 Keywords for the Online Store

2.5.1 Purpose

Keywords are terms that best represent the technical information presented in the standard. They will be used by customers attempting to locate a specific publication. If keywords are not provided at file hand-off, expect to see a query requesting them at the content review stage.

2.5.2 What to Include

All selected keywords should be

- stand-alone terms, not incomplete phrases or unattached adjectives;
- terms determined to be significant by the author or content reviewer;
- as specific and unique as possible; and
- plural forms, if possible (e.g., if “airports” is a keyword, the publication will show up regardless of whether the customer searches for “airport” or “airports”; if “airport” is a keyword, a search for “airports” will return no results).

2.5.3 What to Omit

Do not include

- general terms that apply to dozens or hundreds of AASHTO publications, such as “bridge,” “construction,” or “test;”
- any part of a publication’s title; and
- keywords that are part of other keywords (e.g., if “light rail” is a keyword, “rail” does not need to be included as a separate keyword).

2.6 Text

2.6.1 Front Matter

Be sure to provide

- acknowledgment for cover photos, if any are provided;
- members of any task force(s) that helped produced the content;
- committee list as of ballot passage;
- preface, i.e., statement by the author that may include
 - purpose,
 - research methods,
 - scope,
 - background,
 - brief acknowledgments,
 - permissions granted for use of previously published material, or
 - major changes from a previous edition;
- acknowledgments, separate from the preface if longer or presented as a list;
- introduction, if not part of main text; and

- special technical information that users might need, e.g. a metric conversion chart, a list of uncommon abbreviations, or a chronology.

2.6.2 Main Text

The main text should follow the guidelines in **Part 3, “Style Rules.”** The topics covered in **Sections 8.1** through **8.9** include word choices, spelling, compound words, prefixes and suffixes, capitalization, abbreviations and acronyms, punctuation, **Sections 9.1** through **9.8** cover lists, italic and bold-face type, numerals in text, signs and symbols in text, mathematical expressions, bibliography or reference lists, endnotes, and running text citations. See also **Section 6.3.1.2**.

2.6.3 End Matter

Also be sure to provide all end matter included in the publication:

- Supplementary Requirements
- Annexes
- Appendices
- Glossary
- References
- Index

For more information on each type of end matter, see **Section 6.3.1.3**.

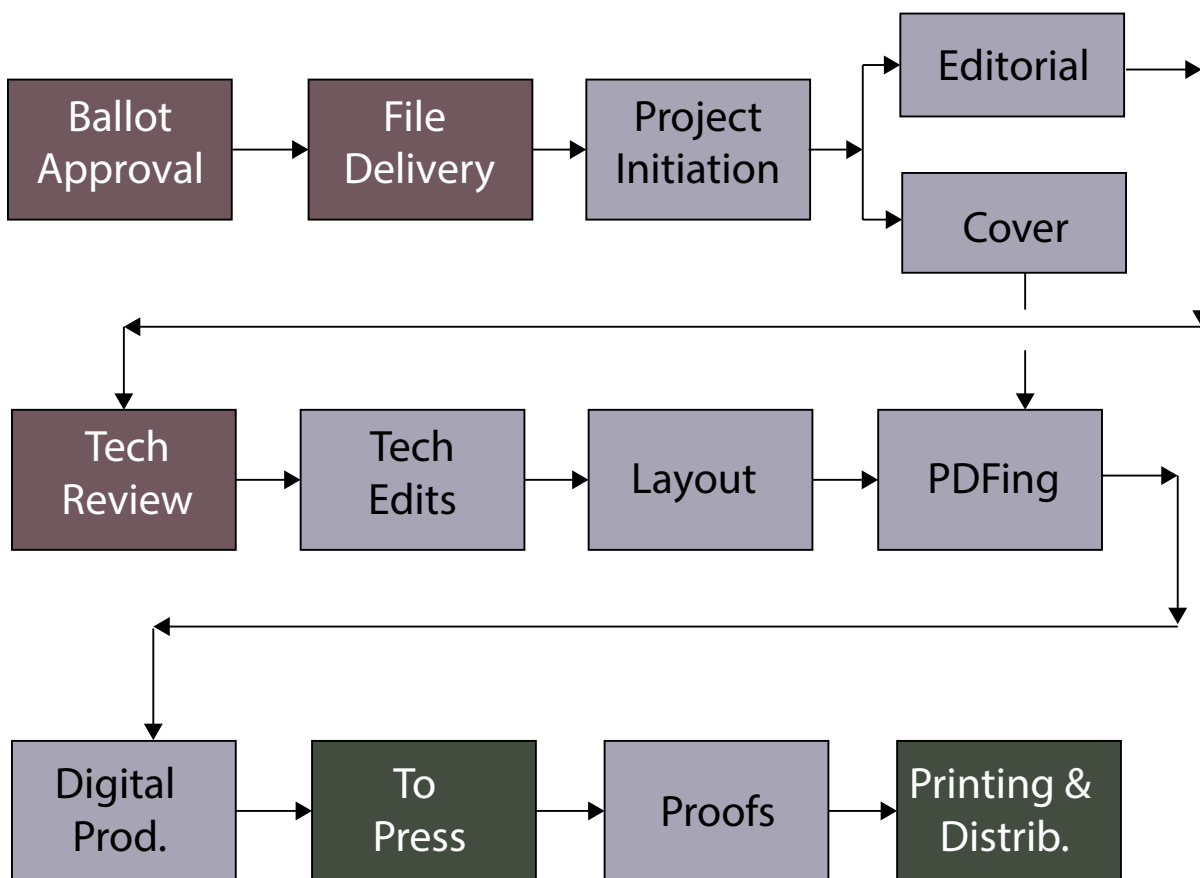
Part 2: Production Team



Chapter 3: Life Cycle of an AASHTO Publication Project

3.1 General

The flowchart shown in **Figure 3.1-1** illustrates the life cycle of an AASHTO document. Upon receipt of a document developed by a committee or task force, the Director of Publications determines the layout design, color options, and printing specifications for the project; fills out a project initiation form; enters the project into the publications database; prepares a publications jacket; sets up the publication folders on the Pubs drive; then passes the file along to the assigned Project Manager.



Note: The Director of Publications determines the publication's distribution format at project initiation.

Figure 3.1-1. AASHTO Publications Project Management Workflow

3.2 Preproduction

The Project Manager first completes the preproduction tasks, which include organizing the components of the publication; setting up the hardcopy files; and preparing tracking charts.

3.3 Production

The second step the Project Manager takes is to ensure that the document is proofread and QCed, and that queries that need to be referred to the content reviewer are compiled. The Project Manager then makes sure that the electronic file is cleaned up and makes any corrections stemming from the copyediting of the document. This editing process may be conducted by the Project Manager, delegated to other Publications staff, or outsourced to a vendor.

At this point, the revised document is laid out. The layout may be done in-house by the Project Manager or another member of the Publications staff, or outsourced to a vendor.

When the layout is complete, the Project Manager sends the revised document and any queries that have been compiled to the content reviewer(s) of the committee or task force. The content reviewers, who are responsible for the accuracy of the document, usually review the final draft within one to four weeks (depending upon the size of the document) and then return their revisions and comments to the Project Manager. The Project Manager and the person doing layout make the final revisions determined during the technical review.

3.4 Ready for Press (If Printing)

When the project is ready for press, the Project Manager transmits the files to the printer and notifies the Publications Administrative Assistant that the files are available to the printer when ready. The printer returns proofs to the Project Manager for review and approval. While the document is being printed, the Publications Administrative Assistant emails the fulfillment paperwork to the printer, the fulfillment company, the Store and Web Services Manager, and accounting.

The printer then sends a sample carton to the Publications Administrative Assistant to check. Upon approval, the Publications Administrative Assistant authorizes shipment of the product to the fulfillment center. The Publications Administrative Assistant also issues transmittal letters so that the fulfillment center can ship the gratis copies to the member departments, instructs the Store and Web Services Manager to make the publication available to the general public, and notifies the Publications Marketing Manager and the AASHTO staff that the publication is available for purchase.

When a new publication supersedes the previous edition or when the appropriate committee so determines, the Director of Publications archives the previous edition of the publication.

3.5 Digital Production

When the final files are ready for press, the Project Manager provides the Store and Web Services Manager with PDF files for the online bookstore/reseller version of the document. The Store and Web Services Manager and sometimes the Project Manager adds bookmarks and hyperlinks to the PDF files. Detailed procedures for this process can be found in another internal document, updated by the Store and Web Services Manager.

If a web-based version is to be produced, the final print files are sent to the conversion vendor for XML/HTML coding. Upon approval of the Store and Web Services Manager, who checks the final copy and hyperlinks, the web-based version is released.

Chapter 4: Project Initiation and Overall Planning

4.1 General

These guidelines are flexible as projects are variable but most publications will follow the initiation and overall planning workflow outlined below.

4.2 About Bids

AASHTO sometimes outsources one or more operations of project production. Selected vendors will be invited to bid on a project based on specifications established by the Director. In general, the lowest bid will be accepted.

4.3 Director's Tasks

The Director will

- Set up the document in the Publications database and the publication folder on the Pubs drive.
- Copy the electronic files to the appropriate publications folders, e.g., Word files in the Text folder and photos and line art in the Graphics folder.
- Fill out the Request for ISBN Number form and send it to the Publications Administrative Assistant.
- Establish the specifications, e.g. print or electronic only, black and white or color.
- Fill out the Project Initiation form and email it to the Project Manager and the Publications Marketing Manager.
- Review bids and select vendor.

4.4 Project Manager's Tasks

The Project Manager will

- Take inventory to ensure that all components of the document have been received, then track down any missing components.
- Set up a file jacket(s) as needed for production, printing only the essentials, e.g. the project initiation form, current project schedule, project-specific editorial decisions, and key correspondence such as tech chair handoff instructions, query responses, and figure permissions. The complete set of production files resides on the Publications network drive for the duration of the project and be copied to a flash drive at closeout.
- In the publication's Graphics folder, organize photos by chapter and determine that each photo is at least 300 dpi (approximately 4 or 5 MB for digital photos) at intended print size. If a photo is lower than 300 dpi, notify the AASHTO Liaison or the chapter author that we will need a replacement photo that is at least 300 dpi. Make sure that all illustration files can be opened and edited.
- Determine and clearly document who will provide the content review for the publication. For the largest publications, create a tracking chart for the content review, if needed. At a minimum, document the name of the reviewer, the date the content review was sent, the date the content review

was returned, and verification that all queries were answered.

- When a publication is reprinted or if a publication has errata, add these elements to the publications jacket for this publication. Unlike errata, interims are separate publications; each interim gets its own publications jacket.

4.5 Publications Administrative Assistant's Tasks

The Publications Administrative Assistant will

- Monitor the publication's ongoing progress through the various production stages.
- Craft bid letters based on specifications.

Chapter 5: Editorial Production

5.1 Proofreading Guidelines

5.1.1 General

The Project Manager or the editorial contractor should take inventory to ensure that all components of the document have been received, then proofread the document. See **“Part 3: Style Rules,”** for a discussion of specific style rules to be used for AASHTO publications. For items not covered in that section, refer to the most recent edition of *The Chicago Manual of Style*.

Guidelines specific to the *Standard Specifications for Transportation Materials and Methods of Testing, and AASHTO Provisional Standards* (Materials Standards) are covered in a separate document, *AASHTO Materials Production Guidelines*, which is updated three times a year (once for each release of the Materials Standards) due to the cumulative nature of the global edits.

5.1.2 Editorial Level/Scope

For revised documents, technical documents in particular, review each section or chapter to ensure that all authorized revisions have been made correctly and that no unauthorized revisions have been introduced.

For all documents, look for grammatical, spelling, and formatting errors and for inconsistencies. Do not make substantive revisions. If a sentence or paragraph needs to be reworded, write the revised copy as a recommendation that can be submitted to the technical reviewer for confirmation.

5.1.3 Style and Format

AASHTO follows *The Chicago Manual of Style* for consistency and uniformity and the *GPO Style Manual* as a secondary source. Please follow these guides closely.

If you change the words in a document on the computer, carefully proofread all around that change because you may either leave in a word from the older version or take out too many words.

Spell out acronyms when first used, with the acronym immediately following in parentheses.

Check the footers and headers to determine that the correct chapter heading is listed and that all pages are numbered sequentially.

5.1.4 Style Sheet

Prepare a style sheet for each publication so that all editorial decisions will be noted and made consistently throughout the document. Use **Annex B1, “Copyedit Style Sheet,”** to document your copyediting decisions.

5.1.5 Figures, Tables, Equations, and Notes

For these items:

- Make sure all referenced matter (i.e. tables, figures, equations, and notes) follows the first in-text callout.

- Make sure all tables and figures (illustrations and photographs) have titles. If AASHTO received permission to use a figure from another source, make sure credit to the owner is noted.
- Number all notes, tables, and figures consecutively throughout a chapter, including ones in appendices, annexes, and supplements.
- Check that the figures (illustrations and photographs) are complete, correct, and legible, and are placed in the correct position in the text.
- Cross-reference text references to figures, tables, or equations.
- Check that all entries in tables are correct and located in proper rows and columns, i.e., under correct headings, and placed in the correct position in the text.
- Check descriptions of tables in text against information on tables themselves.
- Check that equations and formulas are complete and accurate and placed in the correct position in the text. If they must be re-typeset in MathType, query them for review.

5.1.6 Cross References, Citations, and Reference Numbers

Check all cross references in the text, including citations in the text and any reference numbers:

- articles or sections,
- figures,
- tables,
- equations, and
- references.

5.1.7 Bibliography

Verify the bibliographic information in all references, including any URL addresses. Follow the format stipulated in [Section 9.6, “Bibliography or Reference Lists.”](#)

5.1.8 Index

5.1.8.1 General

An index appears as the last element of a publication. The index functions as an organizer to help the reader find a sought-after subject.

Creating an index from scratch is a specialized editorial function that may be outsourced due to its time-consuming nature.

Index terms should be keywords that best represent the technical information presented in the standard. All selected keywords should be stand-alone terms, not incomplete phrases or unattached adjectives.

5.1.8.2 Editing an Index

Index editorial requirements are as follows:

- Alphabetize index entries on a letter-by-letter basis.
- Index entries are capitalized only for proper names.
- Cross-references may be used if warranted. In cross-references, *see* is used to guide the reader to related information; *see also* is used to guide the reader to additional information. In either case, the “*see*” or “*see also*” should be italicized. The *S* should be capitalized if the phrase follows a pe-

riod or is set on a separate line. If the phrase is enclosed in parentheses, the *S* is lowercase. The cross-reference is not followed by a period.

5.2 Proofreader's Marks

Use proofreader's marks shown in [Annex B2](#). Mark every error in both the text and the margin. Mark from left to right. Use slashes in the margins to separate multiple marks or to call attention to inconspicuous marks, if desired.

5.3 Query List

Prepare a list of queries. If a query will affect formatting, contact the staff committee liaison or the technical reviewer to resolve the issue before laying out the document. Otherwise, all queries are submitted to the authors during the technical review. Use the format in [Annex B4, "Query Form,"](#) or similar.

5.4 Electronic Edits and File Management

Make editorial copies of the electronic files. If copyediting of the document was first done on hard copies, insert any edits into the text files, the equations, and the figures. If editorial work is performed by a contractor, all files must be returned to AASHTO upon completion of the project.

Clean up the electronic files:

- Delete files that don't need to be part of the permanent record, e.g., query lists without responses, middle rounds of editing unless there is something controversial that needs to be documented.
- Make sure the latest and greatest versions of the needed files are saved to the master project folder on the Pubs drive.
- Organize everything into the proper subfolders in a way that others will be able to use in case of errata, at reprint time, or when a new edition is planned.

When the revised document has been laid out, send the document and any queries pertaining to it for technical review. If publication is to be laid out in InDesign, save a copy of the file and accept all changes.

5.5 Editorial Quality Control

Once editorial tasks are complete, the Project Manager will assign another editor to look behind to ensure that nothing has been missed.

5.6 Editorial Following Technical Review

When the technical reviewer(s) indicates that the publication is again ready for production, the editor will

- Make any changes resulting from responses to queries. As a best practice, it is helpful when the person putting the changes into the document initials after the queries that they have addressed. This allows the Project Manager to better see which queries are still outstanding and to whom any clarifications should be directed.
- Prepare a clean copy of the final document for the designer.

Chapter 6: Design/Layout

6.1 Overview of Designer's Tasks

The Designer, whether the Project Manager, another AASHTO Publications team member, or a contractor, will:

- Review a clean copy of the final edited document.
- Collate all document files so that the publication is in the correct order. See [Section 6.3.1](#).
- Consult [Sections 6.4](#) through [6.8](#) for a discussion of specific design styles to be used for AASHTO publications.
- Using Adobe Illustrator CC and Adobe Photoshop CC, create or revise figures according to instructions from the chapter authors or technical section chairs.
- Create or revise equations in MathType. This software integrates with Word and is available at <https://docs.wiris.com/en/mathtype/start>.
- Use an existing template or create a new one, depending on the publication.
- Lay out the text, including table captions, tables, and equations. If the document is formatted in Word, use Word's built-in styles and formatting feature. Be sure to separate "character" styles (such as bold, italics, superscript, or subscript fonts) from "paragraph" styles by basing each character style on "(no style)."
- Insert the figures and their corresponding captions in the appropriate text section.
- Review the laid out document for formatting errors. At this point, send the document and any queries pertaining to it for technical review.
- Make any revisions or adjustments as determined during the technical review.
- Prepare PDFs for online distribution and, if necessary, for printing.

6.2 Outsourced Design/Layout

Contractors may be asked to perform any of the design tasks listed in [Section 6.1](#).

All files must be returned to AASHTO upon completion of the project.

6.3 Text Design

6.3.1 Organization of the Document

6.3.1.1 Front Matter

The front matter of AASHTO publications should include all elements listed in [Table 6.3.1.1-1](#).

Table 6.3.1.1-1. Front Matter Components

Page No.	Required Information	Wording/Explanation
Page i	Title of book	[title page may be a black-and-white version of front cover]
	Year of Publication and number of edition if other than first	
	Published by	[If necessary, insert special wording for partnership information, such as, “in cooperation (in conjunction) with FHWA” or “Prepared by Joint Task Force on Segregation of the Subcommittee on Construction and the National Asphalt Pavement Association.”]
	AASHTO logo	
	AASHTO address	American Association of State Highway and Transportation Officials 555 12th Street, NW, Suite 1000 Washington, DC 20004 (202) 624-5800 transportation.org
Page ii	Copyright	© [year] by the American Association of State Highway and Transportation Officials. All Rights Reserved. This book, or parts thereof, may not be reproduced in any form without written permission of the publisher. Printed in the United States of America.
	ISBN: [number]	
	Acknowledgment for cover photos, if necessary	
Page iii	AASHTO Executive Committee	[serving at the time the book will be <i>published</i> , not when it was balloted]
Page iv	Members of task force that produced book	[There may not be any, or there may be several.]
Page v-[-?]	Members of committee that sponsored task force	[Number of pages will depend on size of committee.]
[next right pg.]	Table of Contents (TOC)	[TOC may be followed by a List of Figures, a List of Tables, or both.]
[next right pg.]	Foreword	[A foreword is a statement about the publication written by someone other than the author. In the case of AASHTO publications, it is written by the Project Manager and signed “AASHTO Publications” and deals with the organization of the content or other editorial issues such as the use of interims. .]
[next right pg.]	Preface	[A preface is a statement by the author that may include reasons for undertaking the work, methods of research, scope of the work, background of the work, brief acknowledgments, permissions granted for the use of previously published material, or major changes from a previous edition.]
[back of previous pg.]	Runover of Preface or Acknowledgments (if not part of Preface), or blank even-numbered page	[If the chair of the task force wants to acknowledge support from a large list of individuals, groups, or private companies (such as contractors), place the information in a separate section under the heading of Acknowledgments.]
[next right pg.]	Introduction (if not part of text)	[An introduction is general but relevant material that should be read before the rest of the book. A short introduction that is not part of the text should be paginated with the front matter. A long introduction or one that actually begins the subject matter of the book should be paginated with the text.]
Back of previous pg. [or last right pg. before text]	Special technical information	[technical information that a user might need, e.g. a metric conversion chart, a list of uncommon abbreviations, or a chronology]

6.3.1.2 Main Text

6.3.1.2.1 General

AASHTO delivers information through a wide variety of products—weekly journals, newsletters, communication alerts, websites, policy and committee informational reports, and technical documents. Technical documents include policies, standards, manuals, guides, guide specifications, and technical reports—all of which must be approved for publication by a two-thirds majority of the members.

Technical policies and standards are accepted engineering practices, procedures, or tests that the U.S. DOT and state DOTs have agreed to use or meet; examples of these would be the AASHTO Materials Standards and the *AASHTO LRFD Bridge Design Specifications*.

Manuals, guides, and guide specifications propose a series of options or information to offer direction, but do not recommend a specific course of action; examples include *A Policy on Geometric Design of Highways and Streets*, *AASHTO Maintenance Manual*, *Guide for Design of Pavement Structures*, and *Highway Drainage Guidelines*.

The subject matter of technical reports is similar in character to a guide or manual, but there may be specific circumstances that mitigate against publication as a guide or manual; examples of AASHTO technical reports include *The Use and State-of-the-Practice of Fiber Reinforced Concrete* and *A Synthesis of Safety Implications of Oversize/Overweight Commercial Vehicles*.

6.3.1.2.2 Numbering of Sections or Chapters

In its technical publications, AASHTO adheres to the Modified Decimal Numbering System to show subordinate relationships and to simplify extensive cross-referencing. All technical documents consist of several primary divisions—these may be labeled “sections” or “articles” or “chapters.” Assign primary sections of standards in sequential order beginning with the Arabic numeral “1.”

Number secondary sections with a two-part number consisting of the number used for a primary section followed by a decimal point and then another consecutive serial number (e.g., 1.1, 2.1, 2.2, 2.3 . . . 5.5, 5.6).

Ternary and quaternary sections continue with this same process. Number ternary sections as 1.1.1, 1.1.2, 2.1.1, 2.2.2 . . . 3.1.1, etc., and quaternary sections as 1.1.1.1, 1.1.2.1, 1.1.2.2, 2.1.1.1, 2.2.2.1 . . . 3.1.1.1, 3.1.1.2, etc. Continue this numbering process with all additional section levels. To facilitate cross-referencing, every heading should have a section number associated with it.

Cross-references within the text to other sections should be by number rather than by title, written as “(see Section 2.1)” if the reference is within a sentence or as “(See Articles 2.1 and 3.2.)” if the reference is a separate sentence. The word “Section,” “Article,” or “Chapter” is capitalized but never abbreviated, as in the examples above. Phrases such as “above,” “below,” and “in Chapter #” are unnecessary, as is the title of the referenced section. The phrase “in this publication” or similar should be used only when needed for clarity when combining internal references with references to sections in other publications (e.g., “see Article 5.7.5 of these Specifications and Article 11.2 of the *AASHTO LRFD Construction Specifications*”).

Some technical publications also combine typographic progression with the Modified Decimal Numbering System as a secondary formatting feature to indicate subordination. In these instances, primary (first-level headings) are set in all capital letters and boldface type. Secondary subheadings are set in initial capital letters and boldface type. Third-level headings are set in initial capital letters and either bold or roman type. Subsequent headings may be set in initial capital letters, roman or italic type, and smaller font sizes.

6.3.1.3 End Matter

6.3.1.3.1 Order of End Matter

If there are multiple types of end matter, they should be ordered as follows:

- Supplementary Requirements
- Annexes
- Appendices
- Glossary
- References
- Index

6.3.1.3.2 Appendixes, Annexes, and Supplementary Requirements

Additional information may be included in supplementary requirements, annexes, or appendixes.

- *Supplementary Requirements*—Requirements that apply only when specified within a contract
- *Annexes*—Mandatory information, e.g., detailed information, list of symbols that were used, instructions for operating or calibrating equipment
- *Appendixes*—Nonmandatory information that amplifies statements made in the text, e.g., calculations of equations, charts, data forms, typical applications of the material or procedure being discussed, alternate procedures, or information on physical properties not prescribed in the publication.

Supplementary Requirements, Annexes, and Appendixes are numbered separately from the text of the chapter or publication.

6.3.1.3.3 Glossary

Glossary requirements are as follows:

- Glossary entries are arranged in alphabetical order on a letter-by-letter basis and are aligned with the left margin.
- Each definition begins with a lowercase letter, unless the term is a proper noun, and ends with a period.
- The glossary term should be set in italic type, followed by an em dash and its definition set in roman type. Runover lines may be uniformly indented.
- Nouns are presented in their singular form and verbs in their infinitive form.
- If a term has multiple meanings, the subject field or part of speech should be indicated in angle brackets before the definition.
- Parentheses and square brackets should be used only if they constitute part of the written form of the word, as in “poly(vinyl) chloride.”
- Complete the definition in one sentence. If two or more phrases are needed to state the meaning(s), connect them with semicolons.

6.3.1.3.4 References or Bibliography

See [Section 9.6](#).

6.3.1.3.5 Index

Index design requirements are as follows:

- Index entries may be single spaced in a one- or two-column format.
- Main entries are aligned flush left while subsequent entries are uniformly indented one em space for each level of modification.
- Runover lines are indented one em space deeper than the deepest subentry of that entry.
- If necessary to continue a listing from one page to the next, insert the main entry term again followed by “(continued)” at the top of the next page.

6.4 Overall Document Format

6.4.1 Page Setup

Basic page setup for AASHTO publications is 8¹/₂ in. by 11 in. portrait (tall). Landscape pages should be used only for tables or figures that will not fit on portrait-oriented pages.

New chapters/sections should start on the right-hand (recto) page.

6.4.2 Margins

Documents that are to be perfect-bound or saddle-stitched may be set up with 1-in. margins on all sides or with mirror margins. Publications that are to be 3-hole-drilled are usually set up as mirror margins with a 1.5-in. inside margin and a 0.5-in. outside margin. However, Bridge books are set up with top and bottom margins of 0.7 in. and side margins of 0.95 in. on the inside and 0.7 in. on the outside.

Documents that are to be produced as downloadable PDFs will have additional margin requirements to allow for a copyright statement and digital rights management information (i.e., a watermark with the purchaser’s name). Details are forthcoming.

6.4.3 Typography in Design

6.4.3.1 Font Selection

When choosing fonts:

- In general, limit the use of different typefaces to two within one document.
- Use a serif font for large bodies of text. Times New Roman is the preferred serif choice for AASHTO documents formatted in Word because of its widespread use and its ease of reading.
- Headings, subheads, captions, and small bodies of text may be a serif or sans serif font. Arial is the preferred sans serif choice for AASHTO documents formatted in Word because of its widespread use.

6.4.3.2 Other Font Guidelines

Once fonts are chosen:

- Do not expand or condense typefaces.
- Font sizes generally run between 10 and 12 points for text, 10 and 14 points for headings, and 8 to 10 points for tables. In general, the body text style for AASHTO publications is Times New Roman 11 points normal; for Bridge books, the default text style is Times New Roman 10 pt normal. Never use fonts that are smaller than 7 points. Avoid fonts that are distractingly large.

- Symbols must be of an ASCII format that will not change if the graphic is converted to a PDF. The preferred typeface for AASHTO documents is Symbols.
- Fractions should be presented in the same way— $\frac{1}{2}$ or $\frac{1}{2}$ —not in a combination of ways, e.g., some using diagonal slashes and some with the numerator directly over the denominator, some as fractions and some as decimals, etc.
- Avoid using all caps except for short primary headings or for emphasis. Avoid setting text in boldface, italics, script, or a novelty face.
- Use boldface or italics, however, to help emphasize headings of sections or specialized notices such as warnings, cautions, or notes. (See [Section 9.2](#).)

6.4.3.3 Text Layout Considerations

Other design elements to keep in mind:

- A one-column format is preferred. A scholar's margin may be used for some publications in which the section numbering or other identifying subheads are placed to the left of the body text. Avoid two- or more column formats except for Bridge books, which use a two-column format for text and its accompanying commentary.
- Use lists set off with numbers or bullets. (See [Section 9.1](#).)
- To ensure ease of sustained reading, average line length for large bodies of text should be approximately 50 characters. Avoid using lines for body text that are more than 65 characters or fewer than 39 characters.
- Reverse type or run type over a tinted background only for accent pieces, such as fact boxes, sidebars, or pull-quote boxes.

6.4.4 Page Headers and Footers

6.4.4.1 General

For all publications:

- Headers and footers usually appear 0.5 in. from the edge of the page. In the case of headers, the paragraph should be followed with a minimum of 12 points of white space before the body text.
- Headers or footers usually do not appear on the first page of the chapter. However, if the footer contains only the page number, the footer may appear on the first page of each chapter.
- Headers and footers are often set in roman or italic typeface that is equal to or one point below the typeface of the body text.

6.4.4.2 Nontechnical Publications

Use running headers or footers to provide reference information, i.e., chapter title, document title, technical section number, and page number.

6.4.4.3 Technical Publications

For technical publications:

- The recto (odd-numbered, right-hand) page headers should include the title of the chapter, set flush left if the page number is to be set on the outside corner.
- The verso (even-numbered, left-hand) pages should include the title of the publication, set flush right if the page number is to be set on the outside corner.

6.4.5 Page Numbering

6.4.5.1 General

Use small Roman numerals (i, ii, iii . . . v, etc.) for page numbers in front matter and Arabic numerals (1, 2, 3 . . . 5, etc.) for page numbers in the main body of the publication. If each section has its own table of contents, these pages should be numbered with the section number followed by a hyphen and then the Roman numeral for the page number, e.g., 4-ii would be the second page of the front matter for Section 4. If “divider” pages are used to separate sections of a publication, they should be numbered as the last page of the previous section.

6.4.5.2 Technical Publications

Page numbers usually appear in the outside corner of the header or footer of AASHTO technical publications. Occasionally, the page number may be centered in the footer of the document.

The page number usually includes the chapter number followed by a hyphen and then the page number. For example, the page number for page 9 of Chapter 3 would be written “3-9.” If a document has fewer than 50 pages and sections have fewer than four pages apiece, continuous numbering (i.e., page numbering that does not start again with a new section) may be used.

6.4.6 Leading and Spacing

6.4.6.1 Spacing

In general:

- Use only one space between a period or colon and the text that follows it.
- Use white space to help emphasize special notices such as warnings, cautions, and notes.

6.4.6.2 Nonbreaking Spaces

Use nonbreaking spaces:

- to keep numerals with their corresponding units of measurement and
- to keep callout elements (i.e., section/chapter, figure, table, equation) with their numerals.

The keyboard shortcuts for nonbreaking spaces are as follows:

- Word—Ctrl + Shift + Space bar
- InDesign—Ctrl + Alt + X

6.4.6.3 Leading

Leading (space between the lines) is generally set at type size plus 1 or 2 points. For example, leading for a 10- or 11-point typeface would be line spacing of 1.2. Bridge books use single line spacing. Word and InDesign both have leading presets.

6.4.6.4 Indentation

Include first-line indentation in body text paragraphs. Include a hanging indent for:

- Bulleted, numbered, or lettered lists
- Figure notes, table notes, and endnotes
- Equation legends (“where” lists)

6.4.7 Widows and Orphans

Avoid widows (a single line of a paragraph at the top of a page).

Force an orphan (a single line of type beginning a new paragraph at the bottom of the page) onto the next page.

6.4.8 Blank Pages

For technical publications, all blank pages should include headers, footers, and page numbers. They must also contain the text “This page intentionally left blank.” This text should be centered on the page both vertically and horizontally.

6.4.9 Style Tags

Whether formatting in Word or InDesign, use style tags to maintain consistent formatting.

For bridge books and materials standards, use the established Word templates. (See [Section 6.4.13](#) for more details about formatting in Word.)

6.4.9.1 Paragraph Styles

Include and apply paragraph styles for

- page headers and footers,
- section headings, and
- body text.

Include and apply paragraph styles for any of the following design elements when present:

- vertical lists;
- footnotes and endnotes;
- figure and other graphic placeholders;
- table headings and text;
- equations when not set as running text; and
- figure, table, and note captions.

6.4.9.2 Character Styles

Include and apply character styles for any recurring character attributes that are used to set off text within a paragraph, for example

- italic,
- boldface,
- underlining,
- strikethrough,
- small caps,
- superscript,
- subscript, or
- color (see [Section 6.4.10](#)).

For guidelines on the uses of italic and boldface type, see [Section 9.2](#).

6.4.10 Color

6.4.10.1 General

Publications designed solely for digital distribution (e.g., PDF or web-based) should be full color.

The majority of printed AASHTO publications are printed in black-and-white with color on the covers only. Full-color printing is generally reserved for policy documents, covers, and marketing pieces. (See [Section 6.10.2](#) for information regarding the significance of certain colors associated with AASHTO publications.)

6.4.10.2 Full Color

Use CMYK (cyan, magenta, yellow, and black) colors instead of RGB (red, green, and blue) colors for publication designs. Color photographs should be scanned in RGB and then converted to CMYK mode.

In order to keep costs low, choose four-process colors rather than Pantone colors in design work. Specify whether you want the printer to “use” a specific color (mixing the ink according to the formula in the swatch books) or to “match” a color (to look as close as possible to the color in the swatch book).

6.4.10.3 Spot Color

In order to keep printing costs low, printed publications should use spot color for emphasis or as a design technique only when necessary.

Reverses should be used only as accents or on covers. Screens should be at least 20 percent.

6.4.11 Figures and Tables

6.4.11.1 Position

Figures and tables should follow as closely as possible to the place where they are first cited in the text. See [Section 6.5](#) for detailed information on figure requirements.

6.4.11.2 Numbering

Figures and tables should be numbered separately and named as such. Do not use “exhibit” numbering.

6.4.12 Vertical List Paragraph Formatting

6.4.12.1 General

The formatting of vertical lists should remain consistent throughout the publication.

In general:

- Items in vertical lists may be aligned either flush left or indented in an outline style.
- If items in the vertical lists are bulleted, numbered, or lettered, the paragraph should be set with a hanging indent so that all lines of the paragraph align.
- If numbered or lettered lists are subdivided, the numerals or letters for the top three levels are set off by periods, and those for the lower levels are enclosed in parentheses.

6.4.12.2 Bridge Books

For Bridge books, in light of their two-column format:

- Primary bullets are round and bullet points are flush left.
- Secondary bullet points are discouraged but, when used, bullets should be the round, open type, and bullet points should be indented 0.25 in.

6.4.13 Formatting in Word

6.4.13.1 Placing Graphics

Placing graphic content in Word is handled differently depending on whether it is a photograph or line art, and only one file format per graphic type is acceptable. See [Table 6.4.13.1-1](#).

Table 6.4.13.1-1. Graphic Types, File Formats, and Placement Instructions in Word

Graphic Type	File Format	Placement Instructions
Photograph	JPEG	<ol style="list-style-type: none"> 1. In Word, click on the Insert tab, then on Pictures. 2. Browse to file location and select.
Line Art	EPS	<ol style="list-style-type: none"> 1. In Adobe Illustrator, move all design elements to a single layer. 2. Select all and copy. 3. In Word, click on the Paste pulldown menu, then Paste Special > Picture (enhanced metafile).

6.4.13.2 Creating Tables

Tables may be created directly in the Word file. See [Section 2.2.4](#) for detailed information on formatting tables.

6.4.13.3 Equations and Math Symbols

Create equations in MathType. Mathematical symbols should be inserted using the Symbols font. Create fractions by formatting the numerator as a superscript and the denominator as a subscript. Do not substitute commonly used fractions with the special characters found in Word's AutoCorrect options.

For more details on formatting equations and math symbols, see [Section 6.7](#).

6.5 Figure Design

6.5.1 General

Photographs and line art are generally provided by the author(s) so most of these requirements are contained in [Section 2.1](#).

6.5.2 Checking Graphic Files

Authors should submit graphics as specified in [Section 2.1.2](#). Evaluate all graphics files as early in production as possible in case new files must be acquired, photos retaken, or line art redrawn. Frequent issues include

- unusable file formats,

- low-resolution photographs, and
- line art that cannot be edited.

6.5.3 Checking for Missing Graphic Files

Evaluate the Word files to identify any missing graphic files corresponding to the placeholder images.

6.5.4 Captions

See [Section 2.1.4](#).

6.5.5 Photographs

See [Section 2.1.5](#).

6.5.6 Line Art

See [Section 2.1.6](#).

6.6 Tables

Tables are generally provided by the author(s) so most of these requirements are contained in [Section 2.2](#).

6.7 Equations

6.7.1 Numbering

See [Section 2.3.1](#).

6.7.2 MathType

Equations should be formatted in MathType. If they are not, carefully re-typeset in MathType and query them for technical review.

6.7.3 Mathematical Notation

Standard mathematical notation is used throughout, except as noted below:

- Fences/enclosures are used in the preferred order listed in The Chicago Manual of Style, working from parentheses outward: { [()] }.
- In text, the negative-value symbol and the subtraction operator are both represented by an en dash (–).

6.7.4 Fonts and Symbols

Font and symbol requirements are as follows:

- All variables represented by Roman letters are italicized throughout the text. Variables represented by Greek symbols are not italicized.
- Except for special symbols, the font should be the same as the surrounding text. Subscripts or superscripts should be 3 pt. smaller (but never less than 6 pt.). Variables within the text are set in Word using a TrueType font and italicizing to be consistent with those set in MathType.
- The negative-value symbol and the subtraction operator are both represented by an en dash (–).
- Replace “x” with “×” when it is used as a multiplication symbol.

- Replace “+/-” with “±”.
- In equations, the degree symbol (°) can be used to represent both temperature and angle. Usage will be clear from the context. There should be no spaces within the temperature, as in “30°C” or “67°F.” In running text, degree is spelled out for angles.
- Be careful to use the correct symbol for prime and not an apostrophe or single-quote:
 - Correct: ’
 - Incorrect: ‘
 - Incorrect: ’

6.7.5 Layout

6.7.5.1 Alignment and Line Breaks

Equation alignment and line break guidelines are as follows:

- Individual equations are centered. Formulas with multiple lines are aligned at the equal sign.
- If used when working through formulas, the “therefore” symbol, ∴, appears at the start of a new line.
- A short equation in the text should not be broken. If the text before the equation is short, simply set the equation on a separate line.
- If an equation is too long for one line, the order of preference for splitting the equation is
 - before a “verb” sign (e.g. =, ≠, <, >, ≤, ≈, ≅)
 - before an operator sign (e.g. +, −, ×, ⋅)
 - after a group of parentheses, brackets, or braces
 - before an integral sign (∫)
- Do *not* break equations within bracketed items.
- In split equations, the first line of the equation should be set flush left. Subsequent lines should be indented in such a way that the last line ends at the right margin.
- Two or more equations in a series are aligned on the equal signs, center on the longest equation in the group.

6.7.5.2 Spacing

Equation spacing and line break guidelines are as follows:

- Extra line space may be used between the lines of a split equation in order to make the equation more legible.
- If two equations on the same line are separated by a conjunction, use an em space on each side of the conjunction, as in the following:

$$a + b = c - 1 \quad \text{and} \quad c - 1 = a + b$$

- Between two equations displayed on the same line or between an equation and a condition, use two em spaces, as in the following:

$$x^2 + y^n = z^n - 1 \quad (n = 0, 1, \dots 9)$$

6.7.6 Definition List

A “where” list or equation legend may be used to define the symbols or variables used in an equation.

6.7.6.1 Formatting

Definition list formatting is as follows:

- Insert a lowercase “where:” flush left on the line immediately following the equation.
- On the next line, insert flush left the symbols or variables followed by an equal sign and then the definition of that symbol or variable. They should be listed in the order of their appearance in the equation.
- The equal signs in the list should align.
- Units of measure, if any, should be included at the end of the definition.
- The end of each line is punctuated with commas or semi-colons as warranted, and the final line is punctuated with a period.

6.7.6.2 Example

An example of an equation and its definitions is

$$r = Sbd^2/L \quad (1)$$

where:

r = loading rate, MN/min (lb/min),

S = rate of increase in extreme fiber stress, MPa/min (psi/min),

b = average width of specimen mm (in.),

d = average depth of specimen mm (in.), and

L = span length, mm (in.).

6.7.7 Formatting for InDesign

For InDesign documents:

1. Open an existing MathType equation in Word or create a new equation in MathType standalone.
2. Save a copy of the equation as a new EPS file.
3. Open the EPS file in Illustrator.
4. Convert the text to outlines.
5. Place the equation as a graphic file.
6. Keep a copy of the original MathType EPS file so that the equation may be edited later.

6.8 Hyperlinks

When listing a hyperlink in the references or as a cross reference, format the hyperlink according to the following rules:

- Include the “http://” or “https://” preface in the web address.

- Do not include the slash (/) at the end of the address if you are referencing just the domain name (e.g., “https://www.transportation.org” not “https://www.transportation.org/” regardless of how it appears in your web browser, but use “http://www.transportation.org/design/” if the URL for the lower-level page appears that way in your web browser).
- If the hyperlink flows across more than one line, do not add a hyphen, space, or tab that is not a part of the address.
- Font attributes are governed by the publication format:
 - *Printed in Black and White*—The font should be the same color as its surrounding text and should not be underlined.
 - *Printed in Color*—The font should be a different color than its surrounding text and should be underlined.
 - *Digital Only*—The font should be a different color than its surrounding text and should be underlined.

6.9 Design-Stage Query Edits

Content review (technical or nontechnical) usually takes place after design, although this may depend on the project. If the publication has been designed first, make the technical edits in the design files and clean up the formatting as needed.

6.10 Cover Design

6.10.1 Photo Selection

6.10.1.1 Sources

Cover photos may be

- provided by the author/committee,
- obtained from a stock photo service, or
- taken by AASHTO staff.














6.10.1.2 Photo Selection Approval

For technical publications, photos are subject to review and approval for technical content and worksite safety, if applicable.

6.10.2 Color

AASHTO uses a color-coding system for publication covers based on which committee or task force authors the document. Covers are designed accordingly, e.g., Asset Management books are always a shade of purple, Bridge books are a shade of blue, Design books are a shade of green. See [Table 6.10.2-1](#).

Table 6.10.2-1. AASHTO Cover Color Coding

Publication Topic	Author Committee(s)	Cover Color	
ADMINISTRATION AND ECONOMICS	Agency Administration Managing Committee		Red
ASSET MANAGEMENT AND PLANNING	Committee on Planning		Purple
BRIDGES AND STRUCTURES	Committee on Bridges and Structures		Blue
CENSUS TRANSPORTATION PLANNING PRODUCTS (CTPP)	Committee on Data Management and Analytics		Gold
CONSTRUCTION AND RIGHT OF WAY	Committee on Construction		Brown
DESIGN AND TRAFFIC	Committee on Design		Dark Green
ENVIRONMENT	Committee on Environment and Sustainability; Task Force for Environmental Design; Center for Environmental Excellence		Green
HIGHWAY TRANSPORT AND TRUCKING	Committee on Highway Transport		Gray
JOINT TASK FORCES	AASHTO/ATSSA/ITE Joint Committee; joint publications with NAPA; AASHTO/AGC/ARTBA Joint Committee	<i>Color Varies</i>	
MAINTENANCE	Committee on Maintenance; Winter Advisory Task Force		Orange
MATERIALS, TESTING, AND PAVEMENT	Committee on Materials and Pavements		Dark Red
PASSENGER RAIL AND FREIGHT	Council on Rail; Special Committee on Freight		Teal
REPORTS	<i>Author Committee Varies</i>		Black
SAFETY	Committee on Safety		Yellow

6.10.3 Front Cover

The front cover design should include the following:

- title of the book and any subtitle deemed necessary—in upper half of page;
- number of edition if other than the first;
- year of publication;
- spelled out “American Association of State Highway and Transportation Officials;”
- AASHTO logo; and
- if there is only a front cover and no back cover (e.g., books bound in looseleaf binders):
 - publication code *without* the format suffix component (e.g. -UL, -CD, -WB). and
 - ISBN number.

6.10.4 Back Cover

The back cover design should include the following:

- AASHTO name and address, including web address,
- Publication code (again, without the format suffix component), and
- ISBN number.

Please note that books bound in looseleaf binders do not include a back cover.

6.10.5 Spine

Spines generally include the title, “AASHTO,” year of publication, and sometimes a part or volume number.

6.10.6 Cover Layout Examples

Example cover layouts are shown in [Figures 6.10.6-1](#) through [6.10.6-3](#). Note the direction of the text and inclusion of the AASHTO name/logo on spines.



Figure 6.10.6-1. Full Spread for Saddle-Stitched Publications

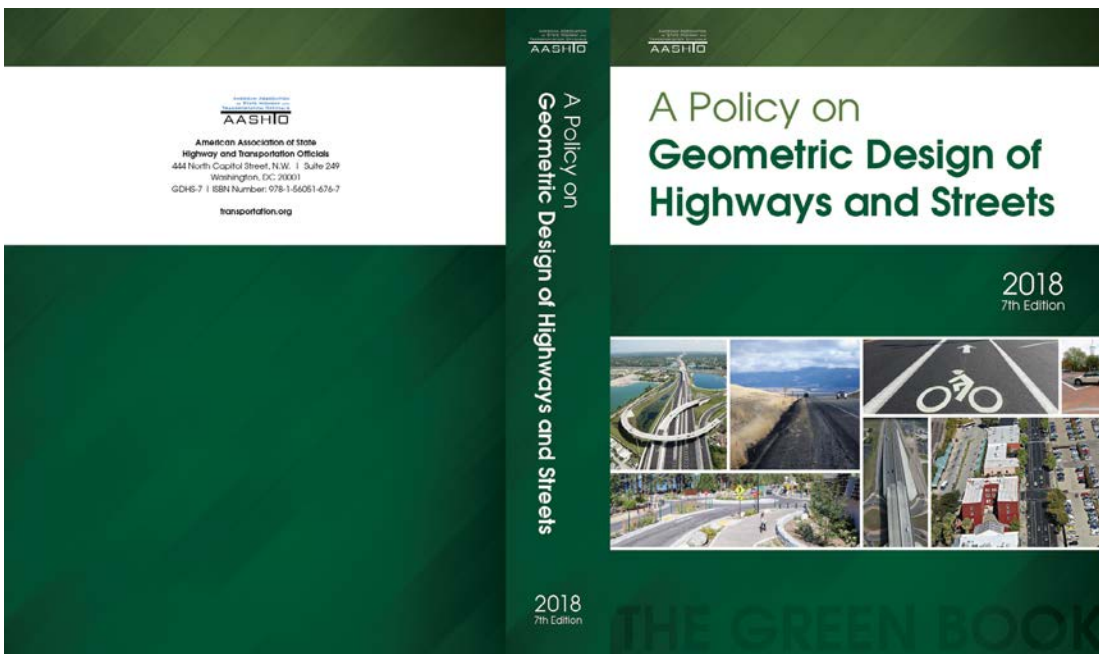


Figure 6.10.6-2. Full Spread for Perfect-Bound Publications

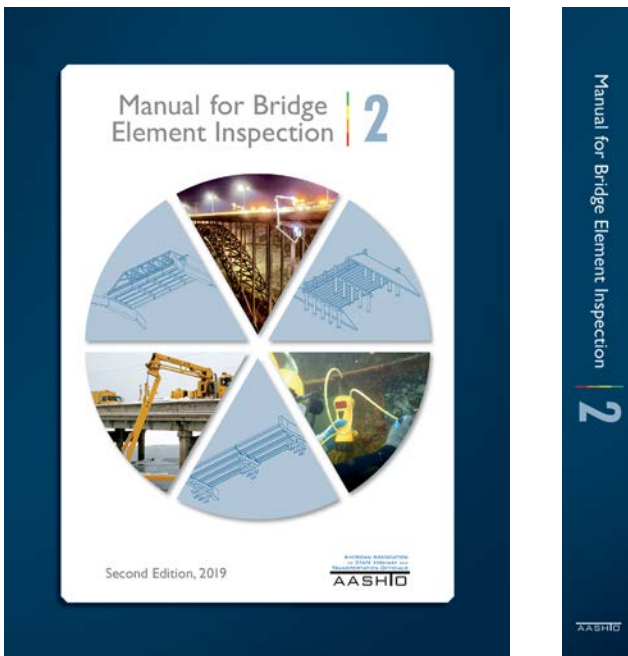


Figure 6.10.6-3. Front Cover and Spine for Looseleaf Books

6.10.7 Cover Design Approval

The Director of Publications has the final say on all cover designs.

6.11 Marketing Design

6.11.1 AASHTO Store Thumbnail

When the cover design is completed and approved, create an image of the cover for the online store according to the following specifications:

- Dimensions: 150 px W × 194 px H
- Format: JPEG
- Color Mode: RGB

A file size of 20 KB or less is preferred. However, image quality should be set no lower than 8 (high).

6.11.2 Marketing and Social Media Ads

Also upon completion and approval of the cover design, produce a series of ads for marketing the publication, all in JPEG format and RGB color mode. See [Annex C1, “Marketing Design Specifications,”](#) for the current, complete design specifications.

6.11.3 Video Icons

6.11.3.1 Design

The designer who created the cover art for the publication shall design two video icons that will be used to identify the video on the TTV Channel, YouTube, and the AASHTO Store, utilizing the same design elements as those in the publication’s cover art.

The video icons, sized as follows, should be 72 dpi, rendered in both PNG and JPEG formats:

- Square video icon: 600 px W × 600 px H
- Horizontal video icon: 507 px W × 285 px H

6.11.3.2 Content

The video icons should include the following information:

- AASHTO logo,
- publication title,
- publication edition,
- year of publication, and
- triangular start button.

6.11.3.3 File Transfer

6.11.3.3.1 Designer

Upon completion of the video icons, the designer emails both video icons to the TTV videographer to place on the TTV Channel and on YouTube. The designer also emails both video icons to the AASHTO Store Manager to place on the AASHTO Store.

6.11.3.3.2 TTV Videographer

Upon completion of the video, the TTV videographer posts the video to the TTV Channel and on YouTube and, subsequently, provides the YouTube URL to the Publications Marketing Manager and to the AASHTO Store Manager.

6.11.3.3.3 AASHTO Store Manager

Having received the video icons and the YouTube URL, the AASHTO Store Manager posts the video to the AASHTO Store.

6.11.3.3.4 Publications Marketing Manager

The Publications Marketing Manager then emails the square video icon the YouTube link, and the description to the committee liaison to post on the committee website.

6.12 Preparing and Delivering Final Publication Output Files

6.12.1 Specified Output Format

The Designer will convert the final content to PDF for whichever format(s) the Director has specified. All fonts should be included.

6.12.2 Downloadable PDF Version

The Project Manager will give a copy of the files to the Bookstore and Web Services Manager to prepare the PDF version. The Project Manager should address any edits or queries resulting from the preparation of the PDF version.

Note that the *Standard Specifications for Transportation Materials and Methods of Testing, and AASHTO Provisional Standards* (Materials Standards) individual standards have their own PDF conversion

settings. These are covered in *AASHTO Materials Production Guidelines* and *AASHTO Materials Individual Standard Preparation*.

6.12.3 Print Version

If the publication will have a print version, the designer will notify the Publications Marketing Manager and the Publications Administrative Assistant when the project is ready for press and transfer the files to the printer by whatever means the printer prefers.

Chapter 7: Printing, Fulfillment, Marketing, and Closeout

7.1 Printing

7.1.1 In-House

If the printing is to be done in-house, the Project Manager completes the SSC Reproduction Work Order form and emails it to SSC at the time of printing.

7.1.2 Outsourced

If a project is to be printed out-of-house, the Publications Administrative Assistant invites selected printers to bid on a project based on specifications established by the Director of Publications. In general, the lowest bid will be accepted.

The Publications Administrative Assistant provides the following information in order to enable the printer to determine an accurate proposal:

- number of copies to be printed;
- paper size;
- number of pages in publication;
- method of transmission (e.g. Dropbox, FTP site) for text and covers;
- type, color, and quantity of artwork;
- type of paper for text;
- type of paper and finishes for covers;
- color of ink for text and covers;
- number of and design of covers and spine (printed one- or two-sided, bleeds, etc.);
- type of binding;
- type of proofs requested;
- delivery instructions (including the delivery of the sample carton);
- schedule required;
- request to provide estimates of shipping costs separately from printing costs; and
- any special requirements or features (e.g., tipping in an oversize map).

7.2 Fulfillment

For full details, see the *Administrative Assistant's Guide*. In general, the Publications Administrative Assistant:

- Calculates the unit cost of the publication and emails this information to Accounting and the Director of Publications;

- Fills out fulfillment documents, i.e., Inventory Management Forms (IMFs), AASHTO Purchase Order, Box Label, and UPS Shipment Request Form, and emails them to the printer and to the fulfillment center; and
- Prepares electronic letters and prepares digital transmittal and/or, if necessary, prepares print transmittal letters and emails letter files with recipient spreadsheet with quantities states to the fulfillment center.

The Director of Publications is responsible for determining the sale price of the publication.

7.3 Marketing

7.3.1 Designer's Tasks

The Designer provides important inputs for marketing the publication:

- high-resolution JPEG of the cover to the Publications Marketing Manager for the catalog and other marketing print uses,
- low-resolution JPEG of the cover to the Bookstore and Web Services Manager for the online store, and
- various banner ads in several formats to the Publications Marketing Manager for posting on the AASHTO Store and sharing via newsletters and social media.

For details about the design specifications of these items, see [Section 6.11, "Marketing Design,"](#) and [Annex C1, "Marketing Design Specifications."](#)

7.3.2 Publications Marketing Manager's Tasks

The Publications Marketing Manager, with the help of the AASHTO liaison or the authors, writes a description of the publication for the catalog, online store, transmittal letters, and other marketing materials.

The Publications Marketing Manager sends the description to the Bookstore and Web Services Manager. The Publications Marketing Manager also sends similar information to the Communications staff so that the availability of the new publication can be announced in AASHTO newsletters and social media vehicles.

The Publications Marketing Manager makes sure the new publication is included in the publications catalog and may also send emails advertising the publication.

7.4 Project Closeout

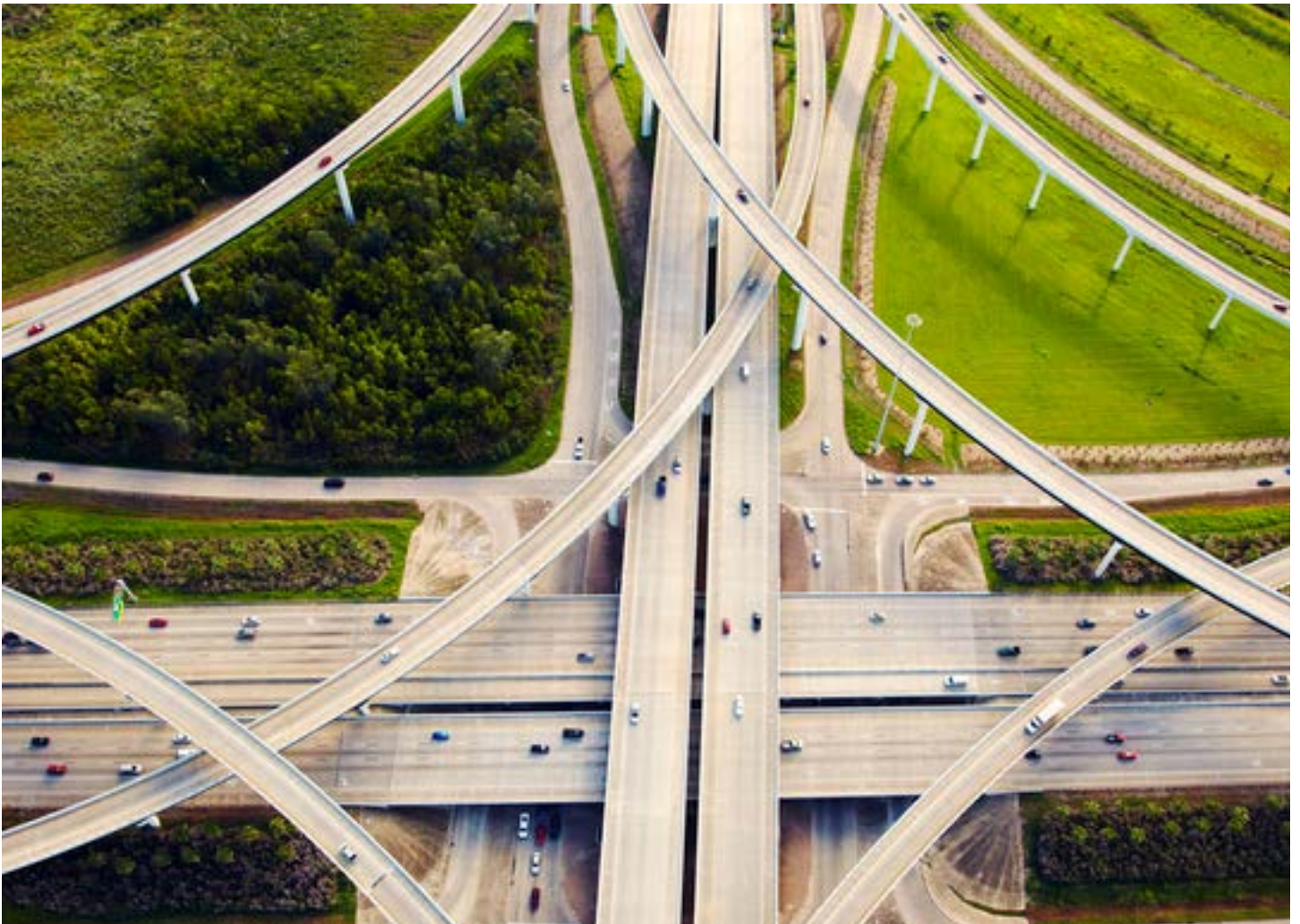
7.4.1 Project Manager's Tasks

Complete Parts 1 and 2 of the closeout worksheet shown in [Annex D1](#). An interactive version of this form resides on the network under K:\00 PUBS ADMIN\Checklists.

7.4.2 Publications Administrative Assistant's Tasks

Complete Part 3 of the closeout worksheet shown in [Annex D1](#), which you will receive from the Project Manager via email. See also the *Administrative Assistant's Guide*.

Part 3: Style Rules



Chapter 8: General Text Rules

8.1 Words to Use with Care

8.1.1 “May,” “Will,” “Shall,” and “Should”

The following have very distinct meanings, particularly in technical documents:

- “May” indicates that a provision is optional.
- “Will” expresses futurity, but never indicates any degree of requirement.
- “Shall” indicates that a provision is mandatory.
- “Should” indicates that a provision is not mandatory, but is recommended as good practice.

8.1.2 Legally Loaded Qualifiers to Use with Care

From a legal standpoint, the following qualifiers should be used with care:

- always,
- never,
- every,
- all,
- safe/safest,
- insure/ensure,
- best,
- reasonable,
- prudent, and
- optimal.

8.1.3 “And/Or”

Avoid using the expression “and/or.” Instead of “A and/or B,” write “A or B, or both.” Similarly, instead of “A, B, and/or C,” write “A, B, or C, or some combination thereof.”

8.1.4 “Etc.”

Avoid using the vague “etc.” Do *not* use it in technical documents; precede list with “e.g.” instead. In nontechnical documents, it is acceptable at the end of a series of three or more elements, but should be set off by commas. Do not use a conjunction in the series when “etc.” is used.

8.1.5 “i.e.” and “e.g.”

The abbreviations “i.e.” and “e.g.” are frequently confused:

- “i.e.” is used to clarify the preceding statement or to indicate that the following list is exhaustive. It is a concise way to express “that is to say.”
- “e.g.” is used to indicate that the following list is not exhaustive. It is a concise way to express “for example... among others.”

8.1.6 Trade Names

Avoid using trade names, in particular in technical documents, unless there is no alternative, e.g., a test using a piece of equipment that is produced by only one manufacturer.

8.2 Spelling

8.2.1 General Guidelines

See [Annex B3, “Preferred Spellings.”](#) See also [Section 8.7, “Capitalization.”](#)

Use *The American Heritage College Dictionary* to check the correct spelling of words. If a dictionary provides more than one spelling, use the first spelling.

For technical terms, AASHTO references

- *AASHTO Transportation Glossary*,
- *ASTM Dictionary of Engineering Science and Technology*, and
- *Civil Engineering Reference Manual for the PE Exam*.

Do *not* use simplified spellings, such as “lite,” “nite,” or “thru.”

8.2.2 Plural Forms

8.2.2.1 “Data”

“Data” is the plural of “datum” and takes a plural verb, per *The Chicago Manual of Style*, 17th Edition’s recommended usage for formal writing: “The data are consistent.”

8.2.2.2 Plurals of Compound Nouns

8.2.2.2.1 Noun Plus Noun

In compound nouns, the significant word takes the plural. The significant word may appear first, in the middle, or last:

- *First*—rights-of-way, notaries public
- *In the Middle*—assistant chiefs of staff
- *Last*—traveled ways, vice chairs, stopping sight distances

When both words are equally significant, they both take the plural:

- Bulletins Nos. 27 and 28
- secretaries-treasurers

If no word is significant in itself, the last word takes the plural:

- jack-in-the-pulpits
- hand-me-downs

8.2.2.2.2 Nouns Hyphenated with an Adverb or Preposition

When a noun is hyphenated with an adverb or preposition, the noun takes the plural:

- passers-by
- hangers-on

8.2.2.2.3 Nouns Ending in *-ful*

Nouns ending in *-ful* form the plural by adding *s* at the end unless it is necessary to express the idea that more than one container was filled. For example,

- five bucketfuls of the mixture (one bucket filled five times)
- five buckets full of the mixture (five separate buckets)

8.2.2.2.4 Compounds without Nouns

When neither word is a noun, the plural is formed on the last word, as in “run-ins.”

8.2.3 Letters, Numbers, Acronyms, or Abbreviations

Plural forms of letters, numbers, acronyms, or abbreviations are formed by adding *s* by itself. Do *not* add an apostrophe. Examples:

- *xs* and *ys*
- the three *Rs*
- in twos and threes
- the 2010s
- state DOTs
- CODs

8.2.4 Foreign Borrowings

Use the “English” versions of plurals for foreign borrowings, such as “appendixes,” “criteria,” “formulas,” “matrixes,” “strata,” and “vortexes.”

8.3 Possessive Forms

8.3.1 Simple Nouns

Possessives of nouns are generally formed as follows:

- *Singular Nouns*—Add an apostrophe and an *s*, e.g. “puppy’s tail” or “an hour’s delay.”
- *Plural Nouns*—Usually, add an apostrophe only, e.g. “puppies’ tails” or “in three days’ time.”
- *Nouns with Irregular Plurals*—Usually, add an apostrophe and an *s*, e.g. “the algae’s development” or “chairmen’s meeting.”

8.3.2 Other Nouns

When the ownership is shared, only the last of a pair (or larger set) of closely linked nouns takes the possessive form, e.g. “my aunt and uncle’s house.” When the ownership is separate, however, both (or all) nouns take the possessive form, e.g. “my son’s and daughter’s friends.”

Compound nouns take the possessive at the end of the compound noun or phrase, e.g., “the mayor of Baltimore’s speech” or “the notary public’s signature.”

8.3.3 Pronouns

There are two types of possessive pronouns and they are treated as follows:

- *Personal Pronouns*—Do not include an apostrophe (e.g. “its,” “hers”).
- *Indefinite Pronouns*—Include an apostrophe (e.g. “one’s,” “another’s”).

8.4 Indefinite Articles *a* and *an*

8.4.1 General Rule: Sound over Spelling

Spelling can be misleading when trying to determine whether to use *a* or *an*. The sound of the modified word, acronym, group of initials, or numerical expression is what governs, not the spelling. Consonant sounds require the use of *a*; vowel sounds require the use of *an*.

AASHTO uses standard American English pronunciation when making these determinations. Use *The American Heritage College Dictionary* to check the standard pronunciation of words. If a dictionary provides more than one pronunciation, use the first pronunciation.

8.4.2 Examples: Spelled with a Consonant but Sounds Like a Vowel

Use *an* before

- silent *h* (e.g. an hour),
- letters that are pronounced with a vowel sound (e.g. “an FHWA report,” “an ASTM standard,” “an NCHRP report”), and
- numerical expressions that start with a vowel sound (e.g. “an 8-ft hole,” “an 11.5-m diameter”)

8.4.3 Examples: Spelled with a Vowel but Sounds Like a Consonant

Use *a* before

- *o* when pronounced with a consonant “w” sound (e.g. “a one-time application”),
- *u* when pronounced with a consonant “y” sound (e.g. “a U.S. DOT report”),
- letters that are pronounced with a consonant sound (e.g. “a BLM area”), and
- numerical expressions that start with a consonant sound (e.g. “a 6-ft radius”).

8.5 Compound Words

8.5.1 Function

A compound word is a group of two or more words or elements treated grammatically as a single term. The phrase may be used as a noun, adjective, adverb, or verb. Examples include

- *Nouns*—crosswalk, cross section, governor-elect
- *Adjectives*—up-to-date, self-sustaining, cross-referenced

- *Adverbs*—overzealously, all-inclusively, somewhat diffidently
- *Verbs*—crash-test, butt-joint, cross-check

8.5.2 Permanent or Temporary Compounds

Compound words may be either permanent compound words or temporary compounds.

- *Permanent*—Generally accepted in the English language and, as such, are listed in the dictionary (e.g. “cost-effective,” “tradeoff”).
- *Temporary*—Joined for a specific purpose (e.g. “cross-sectional,” “time-consuming”).

8.5.3 Types of Compounds

8.5.3.1 Open Compound

An open compound is a combination of separate words that are so closely related as to constitute a single concept. Examples include

- lowest common denominator,
- portland cement concrete, and
- traveled way.

8.5.3.2 Hyphenated Compound

A hyphenated compound is a combination of words joined by one or more hyphens. Examples include

- right-of-way,
- state-of-the-art, and
- candela-hour.

8.5.3.3 Closed Compound

A closed (or solid) compound is a combination of two or more elements, originally separate words, now spelled as one word. Examples include

- groundwater,
- recordkeeping, and
- runoff.

8.5.4 General Rules for Using Compound Words

8.5.4.1 Dictionary First

Because spelling and hyphenation vary greatly among compound words, the first step to establish the correct spelling is to check [Annex B3, “Preferred Spellings.”](#) the dictionary. If the compound word is not listed there, check the dictionary. If it is not listed in either place, follow the general rules in [Sections 8.5.4.2](#) through [8.5.4.5](#).

8.5.4.2 Compound Nouns

8.5.4.2.1 Open

Keep compound nouns open when the elements

- are of equal importance to the meaning, appear in regular order, and have no ambiguous meaning (e.g. “cross section,” “decision maker,” “cost of living,” “carbon monoxide poisoning,” “attorney general,” and “New Yorker”); or
- make up a fraction used as a noun (e.g. “one third of the shipment”). See [Section 8.5.4.3.1](#) for handling a fraction used as an adjective.

8.5.4.2.2 Hyphenated

Hyphenate compound nouns if the elements of a compound word express a unit idea that would not be clearly expressed in unconnected succession (e.g. “right-of-way,” “African-American,” “self-knowledge”).

Use a nonbreaking hyphen between a capital letter and a noun or participle (e.g. “I-beam” or “S-shaped”).

8.5.4.2.3 Closed

Closed compound nouns are less common.

- A compound word formed from two nouns, the first of which consists of only one syllable or one of which loses its original accent, should be written as a closed compound (e.g., “footnote” or “cross-walk”).
- If it does not interfere with comprehension, set as a closed compound any noun that consists of a short verb as the first element followed by an adverb as the second element (e.g. “pickup” or “cooldown,” but hyphenate “run-in” or “cut-in”).

Refer to Sections 6.8 through 6.14 of the *GPO Style Manual* for a list of terms that are usually presented as closed compounds.

8.5.4.3 Compound Adjectives

8.5.4.3.1 Hyphenating Only before Nouns

In general, hyphenate compound adjectives only when they precede the noun being modified. These hyphens help readers determine the relationship between the elements modifying the noun. Examples include

- user-friendly product,
- decision-making policies,
- a three-foot-high wall,
- high-speed train,
- 3-week vacation,
- 3-to-1 ratio,
- cost-of-living increase,
- 12-ft board, and
- one-half gallon.

Compound adjectives should be open (i.e. unhyphenated) when they do not precede a noun (e.g. “a sample one half as large”).

8.5.4.3.2 Compounds to Keep Open before Nouns

Exceptions to the hyphenate-before-nouns rule include

- chemical terms (e.g. sodium chloride solution),
- numeral followed by a possessive noun (e.g. 12 days’ vacation),
- first element comparative or superlative (e.g. better drained soil, highest level decision),
- color terms (e.g. bluish green paint),
- foreign phrases (e.g. in situ testing), and
- percent values (e.g. 5 percent interest).

8.5.4.3.3 Multiple Hyphens

When two or more hyphenated compounds have a common element and this element appears only after the last term, use a hyphen after each modifier, as in “10-, 20-, or 30-mm diameter” and “long- or short-term plans.”

8.5.4.4 Compound Adverbs

For compound adverbs:

- Compound adverbs that begin with “over” or “under” are closed (e.g. “underhandedly”).
- Compound adverbs consisting of spelled-out fractions are always hyphenated, as in “one-half empty.”
- Do not hyphenate compound adverbs that contain an adverb that ends in *ly*, as in “previously known” or “highly developed.”

8.5.4.5 Compound Verbs

Do not hyphenate compound verbs in which a preposition acts as an adverb, as in “burn off” or “blow up.”

8.6 Prefixes and Suffixes

8.6.1 General

Though not strictly compounds, words bearing prefixes or suffixes are treated similarly to compound words—some of these are closed and some are hyphenated. Consult a dictionary to determine whether or not to use a hyphen with a word containing a prefix or suffix.

If the word is not listed in the dictionary, follow the general rules in [Sections 8.6.2](#) and [8.6.3](#).

8.6.2 Prefixes and Hyphens

In general, do not use a hyphen with a word containing a prefix. However, do use a hyphen

- after prefixes added to proper names or numbers (e.g. “un-American” or “mid-2010s”);
- if adding the prefix would repeat a letter or similar term (e.g. “non-native” or “sub-subcommittee”);
- if the omission of the hyphen would make the meaning unclear (e.g. “recreation” and “re-creation”);

- with prefixes that stand alone (e.g. “pre- and postwar relations”);
- with prefixes ex- and self- (e.g. “ex-president” or “self-restraint”); and
- in compounds in which the second element consists of more than one word (e.g. “non-load-bearing beam”).

8.6.3 Suffixes and Spelling

8.6.3.1 Words Ending *l* or *r*

For words ending in *l* or *r*, double the *l* or *r* when adding a suffix (e.g. “controlled,” “occurring,” or “preferred”); there are exceptions (e.g. “canceled,” “totaled,” “transferable,” “traveled”).

8.6.3.2 Words Ending in *e*

Words ending in *e* usually

- drop the *e* before a suffix that begins with a vowel (e.g. “creating,” “movable”); there are exceptions (e.g. “dyeing,” “enforceable,” “knowledgeable,” “mileage,” “singing”).
- keep the *e* before a suffix that begins with a consonant (e.g. “movement,” “wholesome”); there are exceptions (e.g. “judgment,” “wholly,” “truly”).

8.6.3.3 Words Ending in *y*

Words ending in *y* usually

- keep the *y* if preceded by a vowel (e.g. “buyer”) or if the suffix begins with *i* (e.g. “supplying”)
- change the *y* to *i* if preceded by a consonant (e.g. “drier”)

8.6.3.4 Words Ending with Soft *ce* or *ge*

Words with soft endings—*ce* or *ge*—retain the *e* before suffixes beginning with vowels (e.g. “advantageous,” “changeable”).

8.6.3.5 Words Ending with Hard *c*

Words ending with a hard *c* often add a *k* to ensure proper pronunciation (e.g. “shellacked”).

8.6.3.6 Suffixes *-sede*, *-ceed*, and *-cede*

These suffixes sound alike and are often confused.

- “Supersede” is the only word in the English language that ends in *-sede*.
- Only three words—“exceed,” “proceed,” and “succeed”—end in *-ceed*.
- Other words with the same pronunciation end in *-cede*, e.g., “precede.”

8.6.3.7 Suffixes *-ible* and *-ise*

The *GPO Style Manual* lists words ending in the *-ible* and *-ise* suffixes in Sections 5.11 and 5.12, respectively. For further information, check the dictionary.

8.7 Capitalization

8.7.1 General

As a general rule, use initial caps for the following:

- proper nouns (e.g. “John Doe,” “Park Avenue,” “Massachusetts”),
- formal titles or names (e.g. “President Henry Shirley”),
- names of structures and public places (e.g. “Statue of Liberty,” “White House”),
- names of organizations or government agencies (e.g. “American Society of Civil Engineers,” “Federal Highway Administration”),
- names of institutions or companies (e.g. “Library of Congress,” “Transportation Research Board”),
- trade names (e.g. “Pyrex,” “Quickchange® Barrier System”) (see Note),
- first word in a sentence, and
- titles of works.

Note: Exceptions to the rule of trade names include words that have become accepted as generic. These terms include such words as babbitt, cellophane, diesel, kraft, neoprene, nylon, portland cement, and saran.

8.7.2 Hyphenated Compounds

In capitalizing hyphenated compounds in titles of works, headings for sections, or table headings, adhere to the following rules:

- First elements are always capitalized (e.g. “Twentieth-Century Transit Developments”).
- Subsequent elements are capitalized unless they are articles, prepositions, or conjunctions (e.g. “Non-Compact Section,” “State-of-the-Art Report 3”).
- If a compound comes at the end of the title, capitalize the final element regardless of the part of speech it is (e.g. “Successful Safety Features in Vehicles Crashed Head-On,” but “Fatalities in Head-on Crashes”).

8.7.3 Scientific Terminology

Apply the following rules:

- *Biology*—Capitalize the genus name but lowercase the species name (e.g. “Homo sapiens”).
- *Chemistry*—Lowercase the spelled out names of elements and compounds (e.g. “sulfuric acid”). Capitalize chemical symbols and omit periods (e.g. “H₂SO₄”).
- *Laws, Theorems, and Principles*—Capitalize only the proper name (e.g. “Newton’s law,” “Manning’s *n*”).

8.7.4 Direct vs. Indirect References

Use initial caps in direct references to figures, tables, and such (e.g. “Figure 2,” “Table 6-1,” “Section 3.3.4,” “Type 1,” or “Class B”). Use lowercase in less direct references (e.g. “. . . is shown in the same table” or “This chapter discusses . . .”).

8.8 Abbreviations and Acronyms

8.8.1 Abbreviations

8.8.1.1 General

An abbreviation is a shortened form of a compound word or phrase, such as “%” for percent or “assn.” for association. For abbreviations for units of measure, see [Section 9.5.5](#). The abbreviation “etc.” is acceptable. See [Section 8.1.4](#) about using the word.

8.8.1.2 % vs. Percent and ° vs. Degree

Use the symbols “%” and “°” (for angles) in equations, figures, and tables. Spell out “percent” and “degree” or “degrees” in the text, including figure and table footnotes.

8.8.1.3 United States

Spell out United States when the term stands alone. Always use periods in the abbreviation “U.S.” when it is used as an adjective (e.g. “U.S. highways”).

8.8.1.4 U.S. States and Canadian Provinces

When following a city or other geographical term, use the two-letter abbreviation without periods for U.S. states and Canadian provinces (e.g., “AK” for Alaska, “DC” for District of Columbia, “ON” for Ontario). Spell out the name of the state or province if it stands alone.

8.8.1.5 Days of the Week and Months of the Year

Spell out days of the week and months of the year.

8.8.1.6 “NA” for Not Applicable

Capitalize the abbreviation for “not applicable,” i.e., “NA.” Do not include punctuation.

8.8.2 Acronyms

8.8.2.1 General

An acronym is a shortened form of a compound term that uses the initial letters of the term to make a pronounceable word (e.g., “AASHTO”). Acronyms are usually written in full caps.

At its first appearance in the text, an acronym must be enclosed in parentheses and follow the spelled out terms, as in “American Association of State Highway and Transportation Officials (AASHTO).”

For Federal government agencies, use the acronyms listed in www.acronymlist.com.

8.8.2.2 Avoiding Acronyms in Citations

AASHTO publishes many standards. Avoid citing “AASHTO Standards,” “AASHTO,” and “LRFD” without specifying which standards, as each of these could easily refer to over 50 standards published by AASHTO or others.

8.9 Punctuation

8.9.1 Usage of Punctuation Marks

Punctuation marks are used to clarify the meaning of the text and to make reading the text easier. In general, AASHTO prefers “closed” punctuation in order to avoid any misinterpretations of the technical documents. In closed punctuation, a comma or semi-colon is used after each element of a series; see [“Comma”](#) and [“Semi-Colon”](#) in [Table 8.9.1-1](#).

[Table 8.9.1-1](#) provides a brief description of the most common uses for punctuation marks. Since most punctuation rules have qualifications, however, refer to Chapter 5 of *The Chicago Manual of Style* or Chapter 8 of the *GPO Style Manual* for an in-depth discussion of the appropriate use of punctuation marks.

Table 8.9.1-1. Punctuation Mark Uses with Examples

Punctuation Mark	Use	Example
Apostrophe	To replace letters omitted in contractions <i>Note: Do not use contractions in technical writing.</i>	can't, don't, isn't
	To indicate possessive case <i>Note: See also Section 8.3.</i>	ship's bow, Tom's planning, citizens' interest, Virginia and Maryland's border, Wisconsin's and Alabama's programs, someone's design, someone else's design, two hours' delay
	To indicate plural forms of lower-case letters or abbreviations with both capital and lower-case letters	a's and b's, Btu's
Colon	To introduce words, phrases, or clauses in a series if the clause preceding the series is grammatically complete <i>Note: See also Section 9.1.3.3.</i>	The procedures included three crash tests: front end crashes, side crashes, and off-center front end crashes.
	To separate two statements, the second of which amplifies the first	Serving in Congress is not a career: it is a responsibility and an honor.
	After introductory phrases such as "the following" or "as follows"	". . . the following equation: $a + b = c$."
	To introduce long quotations	As Hamlet said: "To be or not to be . . ."
	Between the parts of ratios	H1:V2, 1:15
	In bibliographic entries	<i>Congressional Record</i> . 1930, Vol. 72, Part 10: 10828–30.
	In expressions of the time of day	6:30 p.m.
	After salutations in business letters	Dear Dr. Smith:
Comma	To separate items in a series or lists <i>Note: Use a comma before the conjunction in order to avoid confusion about the meaning of the text. See also "Semi-Colon" and Section 9.1.3.4.</i>	the devastation of hurricanes, tornados, and earthquakes
	to separate two or more adjectives in a series	a clean, dry, lint-free cloth
	to separate compound sentences <i>Note: Do not use a comma to separate compound predicates, e.g., "He drove to town but walked back."</i>	He walked to town, but he rode the bus back home.
	To separate dependent phrases or clauses from the main body of the sentence	
	• introductory clauses	In the late 1980s, the project . . . If the temperature exceeds 20°C, remove . . . Judging from the data, the project . . . When the program began, the staff . . .
	• dependent clauses after a conjunction between two coordinate clauses	Let the mixture dry for at least two hours, or, if time allows, for seven hours.
	• nonrestrictive phrase or clause that cannot be omitted without changing the meaning of the sentence <i>Note: Do not separate a restrictive clause, as in, "You will be more productive if you organize your work space."</i>	The plotted data is shown in Figure 4, a typical representation of test data in these cases.
	• adverbial phrases between the subject and the verb	The Engineer, after reviewing the plans, decided to . . .

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Table 8.9.1-1. *Continued*

Punctuation Mark	Use	Example
Comma, <i>continued</i>	• appositions, complementary phrases, and contrasting phrases	The distance, <i>D</i> , equaled . . . This light, but surprisingly effective, pressure . . .
	• transitional words, parenthetical expressions, and transposed terms that signify a break in the continuity of thought	Furthermore, the data . . . The results were, generally speaking, not successful. The movements, if any, were recorded.
	To separate elements such as <i>etc.</i> , <i>e.g.</i> , <i>i.e.</i> , for example, that is, namely, and similar expressions	Sandstone, for instance, erodes quickly.
	To separate direct quotes from the main body of the sentence	The chairman said, “We plan . . .
	In dates	A report printed on July 19, 1999, indicated that . . .
	In numbers [but not in SI unit numerals]	312,684 mi [503 216 km]
	After a noun or phrase in direct address	Senator, what is your position on . . .
	Before and after indicative titles in a sentence	Hank Williams, Jr., sang . . . Diane Lee, Ph.D., will be . . . Publisher, Inc., has offices . . .
	Between the title of a person and the name of an organization	Executive Director, AASHTO Chair, Committee on Materials and Pavements
Ellipses	To indicate an omission	The boys . . . thought they were safe.
	In mathematical expressions	$x^1 + x^2 + . . . + x^n$
En Dash	To separate inclusive numbers, such as a range of pages, dates, or measurements	pages 4-14-18, 1982-2003, 1.0-1.2 in.
	To express a relationship between two elements that are of equal weight <i>Note: See Annex B3, “Preferred Spellings.”</i>	freeze-thaw public-private partnership silt-clay
	In mathematical expressions, for subtraction or a negative value <i>Note: Use spaces on either side of the en dash for subtraction. Do not use space between the en dash and the value for a negative.</i>	$x - y = z$ -0.25
	In place of a hyphen in compound adjectives in which one of the elements is an open compound	post-World War II boundaries New York-Paris flight
Em Dash	To indicate an element added to give emphasis or explanation to the main clause	Division II—Construction
	To introduce and, when necessary, to follow an enumeration or amplification	Measuring tools—rulers, yard sticks, and tape measures—must be accurate.
	To precede a credit line	An investment in knowledge pays the best interest. —Benjamin Franklin
	To mark a sudden or abrupt change of thought	Neither rain, snow, nor sleet—unless it snows in Florida—will keep the postman from delivering the mail.
	To indicate “no data” breaks in table cells	

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Table 8.9.1-1. Continued

Punctuation Mark	Use	Example
Exclamation Point	To signify a vehement or ironic statement <i>Note:</i> Avoid using exclamation points in <i>all</i> AASHTO publications.	The bomb is going to explode!
Hyphen	In non-inclusive numbers that have two or more elements (e.g. a chapter or section prefix)	page 4-2
	In unit modifiers preceding nouns and consisting of a number followed by a unit of measure <i>Note:</i> See Section 8.5.4.3.1 .	5-cm depth, 1/2-gal container 8-ft-long board, 1/2-in.-diameter pipe 9- and 10-ft sections 9-by-10-ft sections 9- × 10-ft sections one-third share of the profits (but one third of the profits)
	In some compound words <i>Note:</i> See Section 8.5.4.2.2 .	
	• in compound nouns <i>Note:</i> Compound nouns are more often written as separate words, e.g., “closed box girder.” The examples shown to the right are exceptions, not the rule.	right-of-way, self-knowledge
	• between a letter of the alphabet and a noun or participle <i>Note:</i> Use a non-breaking hyphen.	I-beam, T-shaped
	• in compound adjectives or unit modifiers that precede the noun being modified	high-speed train up-to-date files well-maintained equipment decision-making role long- and short-term plans
	In some words with prefixes or suffixes and with prefixes that stand alone	re-create, 10-fold, non-load-bearing, pre- and postoperative examinations
Parentheses and Brackets	Use parentheses	
	• to enclose an explanatory or other secondary comment not intended to be part of the main sentence, but important enough to be included	Chocolate and peanut butter (the two main ingredients of this recipe) make a delicious combination.
	• to enclose acronyms or abbreviations that immediately follow the first use of the spelled-out term	The Transportation Research Board (TRB) publishes the <i>Transportation Research Record</i> .
	• to enclose bylines in Congressional documents	(By Emery Jones, research assistant)
	• to enclose numerals or letters in enumerated lists	The three factors that weather reports usually include are (1) temperature, (2) precipitation, and (3) barometric pressure. The common needs of all people include (a) food, (b) shelter, and (c) clothing.
	• to enclose numbered references cited in the text	See Section 19 of Reference (11).
• to enclose U.S. Customary units for hard conversions (rounded metric units) in dual unit publications	1 m (3.2 ft)	

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Table 8.9.1-1. *Continued*

Punctuation Mark	Use	Example
Parentheses and Brackets, <i>continued</i>	• to enclose U.S. Customary units for hard conversions (rounded metric units) in dual unit publications	1 m (3.2 ft)
	Use brackets	
	• to enclose U.S. Customary units for soft conversions (exact re-stating of metric measurements in conversions) in dual unit publications	1 m [3.281 ft]
	• to enclose editorial comments within the text	They [the zoologists] discovered several new species of starfish.
	• to enclose parenthetical remarks within parentheses	
	• in equations or other mathematical expressions to indicate that the enclosed matter should be treated as a unit	$x = [(a \times b) + c] - d^2$
Period	At the end of a complete declarative or imperative sentence	I came, I saw, I conquered. See if you can do better.
	After numerals or letters in numbered or outline lists	1. chromium 2. lead a. chromium b. lead
	In abbreviations <i>Note: Do not use in abbreviations for 1) states or provinces or 2) units of measurement except for “in.”</i>	U.S., Ms., Mt. Everest, E. A. Poe
	As decimal points in mathematical expressions	1.65 cm, \$1.25, 65.5 percent
Question Mark	To indicate a question	Has the ballot closed yet?
Quotation Marks	Use single quotation marks	
	• to enclose quoted or emphasized material <i>within</i> a direct quotation	The student asked, “What do you mean by ‘outline numbering?’”
	Use double quotation marks	
	• to enclose direct quotations	“Thank you for your warm welcome,” said the keynote speaker.
	• around words or phrases to indicate a new or special meaning at the first use of the term in the document	In this case, “gauge length” means the distance over which the deformation measurement is made.
	• to enclose instructions or commands	Type “Control + Shift + Space Bar” to insert a non-breaking space.
	• to enclose title of chapters/sections in text citations <i>Note: Where possible, cite by chapter/section number and omit the title entirely. See Section 5.1.6.</i>	See Section 5.1.6, “Cross References, Citations, and Reference Numbers.”
Semi-Colon	Between clauses of a compound sentence if they are not joined by a conjunction	The rain ended in the afternoon; the sun shone brightly.
	To separate clauses of a compound sentence joined by a conjunction and containing commas within the clause	The cold, steady rain ended; but the clouds lingered on.
	To precede transitional phrases that link clauses of a compound sentence	The rain ended; consequently, the rainbow disappeared.

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Table 8.9.1-1. *Continued*

Punctuation Mark	Use	Example
Semi-Colon, <i>continued</i>	To precede transitional terms that introduce an independent clause	Precipitation composed of liquid H ₂ O ceased to fall from the clouds to the earth; that is, the rain ended.
	To separate elements in a series if the elements contain internal punctuation	The precipitation of water from the atmosphere can appear in the form of mist, including fog; rain; cold, icy sleet; hail, i.e., pellets of ice; and snow.
Slash <i>Note:</i> Also called solidus, slant, or virgule.	To signify division in fractions, mathematical expressions, and units of measure	$\frac{4}{5}$ <i>a/b</i> 10 m/s
	To indicate alternatives or alternative spellings	upstairs/downstairs, tradeoff/trade-off
	To link two terms when a hyphen or en dash would be confusing	electrode/electrolyte interface

8.9.2 Placement of Punctuation Marks

8.9.2.1 Colon

A colon should *not* be used to introduce a list that is the object of an element in the introductory clause (e.g., “Care should be taken to (1) weigh the sample carefully, (2) determine that the sample is dry, and (3) ensure that the scale is accurate.”)

8.9.2.2 Comma

8.9.2.2.1 Serial Comma

A serial comma is one that is used after the penultimate item in a series or enumerated list of three or more items, before “and” or “or” (e.g. “concrete, steel, or aluminum”). AASHTO style includes use of the serial comma, following *The Chicago Manual of Style*.

8.9.2.2.2 Compound Predicates

A compound predicate refers to two or more verbs having the same subject. Three or more compound predicates fall under the serial comma rule in [Section 8.9.2.2.1](#).

Do *not* use a comma to separate only two compound predicates unless necessary to avoid confusion. Examples:

- *Clear without Comma*—The project included a parking lot and bus station.
- *Clearer with Comma*—The project included a park and ride, and bus station.

8.9.2.2.3 Additional Comma Guidance

A comma should *not* separate

- an introductory adverbial phrase that immediately precedes the verb it modifies (e.g., “Out of the storm ran the five children.”).
- an adverbial phrase, transitional word, parenthetical expression, or transposed term if the element creates no significant break in the continuity of thought; consider if there would be pauses if the sentence were spoken aloud (e.g. “The test samples were therefore reexamined.”).

Do use a comma before the transitional adverbs “yet” and “so.”

8.9.2.3 Ellipses

8.9.2.3.1 General Rules

Ellipsis points are periods set with nonbreaking spaces or em spaces between them and are used to indicate omission within quoted text. If the omission occurs

- *Within a Sentence or Fragment*—Add a space before and after the three ellipsis points.
- *Between Paragraphs*—Ellipsis points are not necessary at the beginning of a sentence unless more than one paragraph is being quoted in block text. In that case, use ellipsis points at the end of the first paragraph and at the beginning of the second paragraph.
- *At the End of a Sentence*—Include punctuation for that sentence.
- *At the End of a Fragment*—Do not include punctuation in addition to the ellipsis points.

Section 8.9.2.3.2 shows two complete paragraphs. Correct examples of the use of ellipses using these paragraphs are shown in **Sections 8.9.2.3.3** through **8.9.2.3.6**.

8.9.2.3.2 Original Paragraphs

Fourscore and seven years ago, our fathers brought forth upon this continent a new nation: conceived in liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war testing whether that nation or any nation so conceived and so dedicated can long endure. We are met on a great battlefield of that war.

8.9.2.3.3 Example: Within a Sentence or Fragment

Fourscore and seven years ago, our fathers brought forth upon this continent a new nation . . . dedicated to the proposition that all men are created equal.

8.9.2.3.4 Example: Between Paragraphs

Fourscore and seven years ago, our fathers brought forth upon this continent a new nation. . . .

. . . testing whether that nation or any nation so conceived and so dedicated can long endure. We are met on a great battlefield of that war.

8.9.2.3.5 Example: End of a Sentence

Fourscore and seven years ago, our fathers brought forth upon this continent a new nation. . . .

8.9.2.3.6 Example: End of a Fragment

Fourscore and seven years ago . . .

8.9.2.4 Question Marks

There are instances when an interrogative pronoun is used but a question mark should *not* be:

- When the question consists of a single word within a sentence (e.g. “He asked himself why.”),
- When a request is courteously disguised as a question (e.g. “Will you please pass the butter.”), or
- When a question is stated indirectly (e.g. ““How to reduce stress is the question on everyone’s mind today.”).

8.9.2.5 Quotation Marks

8.9.2.5.1 Placement in Relation to Other Punctuation

Place quotation marks

- after commas and periods,
- before colons, semicolons, and footnote reference numbers, and
- within a closing quote when they are part of the quoted text (e.g. Mary said, “Tom was right when he said, ‘We’ll never make the deadline!’”)

8.9.2.5.2 Other Guidance

Do not use quotation marks (single or double) to set off an unfamiliar term or specialized word usage; use italics instead.

Use a thin nonbreaking space or expanded kerning of the font to separate adjacent double and single quotation marks and between adjacent superscripts (including fractions) and quotation marks.

8.9.2.6 Parentheses

Set the terminal punctuation inside the parentheses or brackets when the text enclosed within parentheses or brackets stands alone as a separate sentence (e.g. “The statistical data can be found in Table 6 of this report. (See also Figure 5.)”)

Set the terminal punctuation outside the parentheses or brackets if the sentence within parentheses is located within another sentence (e.g. “The statistical data can be found in Table 6 (see also Figure 5) of this report.”).

8.9.3 When to Italicize Punctuation Marks

8.9.3.1 Terminal Punctuation

If a colon, question mark, or exclamation point immediately follows italicized text but is not part of the italicized text, then the punctuation mark should be set in roman type. For example,

Has anyone seen my copy of the *Roadside Design Guide*?

Have you read *Who Moved My Cheese*?

8.9.3.2 Parentheses

If all of the material enclosed in parentheses or brackets is in italic style font, then the parentheses or brackets in running text (but not equations) should be italic. If part of the enclosed material is in roman text, then the parentheses or brackets should be in roman text, with the exception of reference citations.

Chapter 9: Special Text Rules

9.1 Lists

9.1.1 General

Lists may be used to organize and present material in a concise manner that makes the information easily understood. The information may be run into the text of a sentence or displayed as a vertical list.

Generally speaking, AASHTO prefers that vertical lists be bulleted; however, numbered lists should be used for processes and ranking, and lettered lists for outlines or conditions/scenarios.

9.1.2 Lists as Running Text

9.1.2.1 Capitalization in Running Text Lists

Set lists as lowercase (i.e., no initial caps) unless each list item is a complete sentence.

9.1.2.2 Punctuation in Running Text Lists

Punctuation guidelines for lists within sentences are as follows:

- Simple items listed within the sentences should merely be separated by commas.
- Number long, complex lists with numerals or lowercase italic letters in parentheses, for example, “. . . consist of (1) acquiring food, (2) purifying water, and (3) building shelter.”
- If the phrases or clauses comprising the list contain commas or other punctuation, then the items of the list should be separated by semi-colons; for example, “The precipitation of water from the atmosphere can appear in the form of mist, including fog; rain; cold, icy sleet; hail, i.e., pellets of ice; and snow.”

9.1.3 Vertical Lists

9.1.3.1 General

This section covers capitalization and punctuation in vertical lists. For guidance on format, see [Section 6.4.12](#).

9.1.3.2 Capitalization in Vertical Lists

9.1.3.2.1 Introductory Clause Is Grammatically Incomplete

If items in a vertical list complete a sentence begun in the introductory clause and are separated by commas or semi-colons, then the items in the list begin with lowercase letters (see [Section 8.7](#) for exceptions). For example,

Requirements consist of

- acquiring food,

- purifying water, and
- building shelter.

9.1.3.2.2 Introductory Clause Is Grammatically Complete

If the preceding introductory clause is grammatically complete, the items in vertical lists are usually capitalized. For example,

Requirements consist of three items:

- Acquiring food
- Purifying water
- Building shelter

9.1.3.2.3 One or More List Items Is a Complete Sentence

If the preceding introductory clause is grammatically complete and one or more of the list items is a complete sentence, then all items should start capitalized (and end in periods; see [Section 9.1.3.3](#)). For example,

Requirements consist of three items:

- Food (provided by the campers).
- Water (provided in large coolers) at the camp sites.
- Shelter will be four-person tents.

9.1.3.3 Punctuation in Introductory Clauses

Do *not* use a colon if the introductory clause preceding the vertical list is not grammatically complete.

Use a colon to introduce vertical lists if

- The introductory clause preceding the vertical list is grammatically complete on its own;
- The introductory clause contains an introductory phrase (e.g. “as follows,” “the following”).

9.1.3.4 Punctuation in Vertical Lists

If the items complete the preceding introductory clause, punctuate the vertical lists as if the items were running text as follows:

- Use commas to separate simple list items and a period after the final item.
- If the items are long and complex or contain their own punctuation, separate the items by semicolons instead of commas.
- If one or more of the list items is a complete sentence, then all items should end in periods (and start capitalized; see [Section 9.1.3.2.3](#)).

9.1.3.5 Numbering or Lettering Vertical Lists

Use numbers or letters with vertical lists in which the items indicate order of importance or sequence. Use bullets for all other vertical lists.

If numerals or letters used to enumerate items in a vertical list are not enclosed in parentheses, place a period after the numeral or letter.

9.2 Italic and Boldface Type

9.2.1 Purpose

Italic and boldface type are highlighting techniques that help readers find important or special text.

9.2.2 Italic

Use italic type to indicate

- Titles of books—*Roadside Design Guide*,
- Foreign phrases—*in situ*,
- Legal cases—*Scenic America, Inc. v. Department of Transportation*,
- Scientific names—*Streptococci*,
- Reference citations—Reference (10),
- Variables (except for Greek symbols) in mathematical expressions— $a + b = c$,
- New terms at first use,
- Minor headings, and
- Cautions or warnings.

See also [Section 8.9.3, “When to Italicize Punctuation Marks.”](#)

9.2.3 Boldface

Use boldface type to indicate

- Major headings, and
- Captions.

9.3 Numerals in Text

9.3.1 General

Use Arabic numerals (i.e. 1, 2, 3...) except as specified in [Sections 9.3.2](#) through [9.3.4](#). A spelled-out number should not be repeated with an Arabic numeral in parentheses, even contractually. See [Section 9.5.5](#) for the use of decimals and fractions.

9.3.2 First Word of Sentence

Spell out any numeral that is the first word of a sentence. If a unit of measurement begins a sentence, spell out both the numeral and the unit of measurement (e.g. “Five feet below the surface...”).

9.3.3 Numerals One through Nine

Spell out numerals one through nine except when they

- are followed by a unit of measure or percentage (e.g. “3 ft” or “5 percent”);
- are part of a mixed number (e.g. “1.5” or “3¹/₂”);
- specify a mathematical expression (e.g. “square root of 4” or “divide by 6”);
- are part of inclusive numbers expressed with en dashes (e.g. “2–4 days”);
- express ratios (e.g. “1 to 4” or “1:15”);

- appear in a statement containing two or more numbers, one of which is greater than nine (e.g. “2 to 10 hours”);
- follow an abbreviation (e.g. “Vol. 2”); or
- indicate an edition number (e.g. “3rd ed.”).

9.3.4 Spelling Out for Clarity

For clarity, spell out numerals

- when a quantity precedes a measurement (e.g. “twenty 30-mm rods”); and
- in large numbers (e.g. “\$5.3 million,” \$12 billion”).

9.4 Signs and Symbols in Text

Symbols must be of an ASCII format that will not change if the graphic is converted to a PDF. The preferred typeface for AASHTO documents is Symbols.

9.5 Mathematical Expressions

9.5.1 General

Be consistent. Do not mix symbols and names of units. Do not express fractions in a mixture of styles. See [Sections 6.7](#) for equations.

9.5.2 Ratios

Express ratios as “1 to 4” or “1:4” but not as “1-4.”

9.5.3 Numerals in Mathematical Expressions

Use Arabic numerals (i.e. 1, 2, 3...).

9.5.4 Signs and Symbols in Mathematical Expressions

9.5.4.1 General

Symbols must be of an ASCII format that will not change if the graphic is converted to a PDF. The preferred typeface for AASHTO documents is Symbols.

9.5.4.2 % vs. Percent and ° vs. Degree

Use the symbols “%” and “°” (for angles) in equations, figures, and tables. Spell out “percent” and “degree” or “degrees” in the text, including figure and table footnotes.

9.5.4.3 Frequent Symbol Mistakes

Do not substitute

- the letter “O” for zero,
- the letter “l” for a one,
- the letter “x” for a multiplication sign,
- a hyphen for either a minus sign or a negative number symbol,
- an apostrophe or single quote for a prime symbol,

- the three-character sequence “+/-” for the plus-or-minus symbol, or
- the masculine ordinal for a degree symbol.

In Word, if you are unsure whether the correct symbol is being used, check as follows:

1. Highlight the character.
2. Click on the Insert tab.
3. Click on Symbol.

9.5.4.4 Spacing around Signs and Symbols

Include spaces

- on each side of a mathematical symbol between two quantities (e.g. “ $a + b = c$,” “ $15 \div 5 = 3$,” “32 in. \pm 0.5 in.”), or
- on each side of function abbreviations (e.g. “ $2 \cos \theta$ ” or “ $\log p$ ”) except when the function is enclosed in fences

Do not include spaces

- if the symbol expresses a degree of the number (e.g. “ -4°C ,” “ -25 ,” or “ $\pm 6 \text{ mm.}$ ”),
- when a function is enclosed in fences (e.g. “ $\exp(a + b \times \ln(\text{AADT}_{\text{maj}}) + c \times \ln(\text{AADT}_{\text{min}}))$ ” or “ $\hat{\sigma}'_i = A_{\sigma_0} + A_{\sigma_1} \cos(\omega_0 t_i) + B_{\sigma_1} \sin(\omega_0 t_i)$.”), or
- between a symbol or numeral and its associated subscript or superscript.

9.5.4.5 List Order

When presented in a list, symbols, abbreviations, and acronyms should appear in the following descending order:

- Roman (English) alphabet capital letters,
- Roman (English) alphabet lowercase letters,
- Greek alphabet capital letters,
- Greek alphabet lowercase letters,
- Subscripts,
- Superscripts, and
- Special notes.

9.5.4.6 Multiple Definitions

If a symbol, abbreviation, or acronym has more than one definition, the explanations are separated by a semicolon, and each definition is explained at its first use in the publication.

9.5.5 Decimals and Fractions

9.5.5.1 General

Do not mix decimals and fractions.

9.5.5.2 Decimals

When a numerical value includes a decimal point,

- always place a zero before the decimal point if the unit is less than one (e.g. “0.03 in.”), and
- omit a zero after the decimal point unless it reports a significant digit (e.g. “10.5 ft”).

9.5.5.3 Fractions

The rules for fractions are as follows:

- Be consistent. Fractions should be presented in the same way— $\frac{1}{2}$ or $\frac{1}{2}$ —not in a combination of ways, i.e., some using diagonal slashes and some with numerator stacked directly over the denominator, etc. Convert all single-character fractions (e.g. “ $\frac{1}{4}$ ”) to the style being used in the rest of the document.
- Mixed numbers, i.e., whole number plus a fraction, are always expressed in numerals.
- Fractions that are followed by “of a” or “of an” are generally spelled out.

9.5.6 Units of Measure

9.5.6.1 General

The following rules apply to units of measure in general:

- If a unit of measurement begins a sentence, spell out both the numeral and the unit of measurement (e.g. “Five feet is the minimum acceptable...”).
- Use the correct unit abbreviations in text, figures, tables, and equations (see [Table 9.5.7.5-1](#)). Note that
 - units are abbreviated identically in the singular and the plural (e.g. “5 lb” not “5 lbs”) except for “kip,” which is treated as a word;
 - units derived from proper names are all abbreviated with initial caps (i.e. “Hz,” “N,” “Pa,” and “K”), but some are lowercase when spelled out (“hertz” and “newtons”) and others retain their initial caps when spelled out (i.e. “Pascal” and “Kelvin”); and
 - “liter” is abbreviated by uppercase “L” to avoid confusion with numeral “1” (e.g. “mL”).

9.5.6.2 Hyphens and Spacing

Regarding hyphens and spacing, the following rules apply:

- Do *not* hyphenate a modifier consisting of a number followed by a possessive noun (e.g. “two months’ work,” *not* “two-months’ work”).
- Except for expressions of percent, place a nonbreaking hyphen (in Word, hit “Control + Shift + hyphen”) between numbers and measurement units if the term is a modifier that precedes a noun (e.g. “6-ft board” or “3-in. diameter” but “diameter of 3 in.”); see [Section 8.5.4.3](#).
- Otherwise, use a nonbreaking space (in Word, hit “Control + Shift + Space bar”) between the numerical value and the unit abbreviation.

9.5.7 SI and U.S. Units

9.5.7.1 Dual Unit Order

In AASHTO publications with dual units, metric units appear first and are followed by U.S. Customary units in parentheses.

9.5.7.2 Conversions in Parentheses vs. Flat Brackets

In dual unit publications, use parentheses to enclose U.S. Customary units for hard conversions (rounded metric units, such as “1 m (3.2 ft)”) and brackets to enclose U.S. Customary units for soft conversions (exact re-stating of metric measurements in conversions, such as “1 m [3.281 ft]”).

Note that the term “hard conversion” is rather misleading; a new, physical (i.e. hard) item is manufactured to meet the “hard metric” specifications.

9.5.7.3 Spelling and Punctuation

Use “liter” and “meter” when spelling out SI units. Be careful with the “m” SI prefix abbreviations, “M,” “m,” and “μ.” See [Table 9.5.7.5-2](#) for the values of these prefixes.

Abbreviate “inches” with a period as “in.” to avoid confusion with the word “in”. Use the period in all U.S. customary units that include “inches” (e.g. “in.³,” “kip-in.”).

9.5.7.4 Number of Digits in SI

Use only numbers between 0.1 and 1000 to express the quantity of SI units. For example, 12 000 m is preferably written as 12 km. Similarly, it would be preferable to write 0.003 cm³ as 3 mm³.

9.5.7.5 Unit of Measure Abbreviations

Unit of measure abbreviations follow the primary recommendations from *The Chicago Manual of Style* for U.S. Customary Units and IEEE/ASTM SI 10 for SI Units.

Acceptable abbreviations of commonly used terms are as shown in [Table 9.5.7.5-1](#). SI prefixes with their abbreviations and values are listed in [Table 9.5.7.5-2](#).

Table 9.5.7.5-1. Abbreviations for U.S. Customary and SI Units

U.S. Customary Units		SI Units	
Length			
in.	inch	mm	millimeter
ft	foot	cm	centimeter
yd	yard	m	meter
mi	mile	km	kilometer
rd	rod	—	—
Area			
in. ²	square inch	mm ²	square millimeter
ft ²	square foot	cm ²	square centimeter
yd ²	square yard	m ²	square meter
mi ²	square mile	km ²	square kilometer
rd ²	square rod	—	—
acre	acre	—	—
ha	hectare	—	—
Volume			
in. ³	cubic inch	mm ³	cubic millimeter
ft ³	cubic foot	cm ³	cubic centimeter
yd ³	cubic yard	m ³	cubic meter
Weight/Mass			
oz	ounce	g	gram
lb	pound	kg	kilogram
ton	ton	t	metric ton
kip	kip	—	—
Liquid Measure			
C	cup	mL	milliliter
pt	pint	L	liter
qt	quart	—	—
gal	gallon	—	—
Time			
s	second	s	second
min	minute	min	minute
h	hour	h	hour
yr	year	yr	year
Velocity			
ft/s	feet per second	m/s	meters per second
ft/min	feet per minute	m/min	meters per minute
ft/h	feet per hour	m/h	meters per hour
mph	miles per hour	km/h	kilometers per hour
rpm	revolutions per minute	—	—
Acceleration			
ft/s ²	feet per second squared	m/s ²	meter per second squared

Continued on next page

Table 9.5.7.5-1. Continued

U.S. Customary Units		SI Units	
Force			
kip (lbf)	pound force	N	newton
—	—	kN	kilonewton
kip-in.	pound force per inch	N/m	newton per meter
kip-ft	pound force per foot	N/kg	newton per kilogram
Pressure or Stress			
bar	bar	Pa	Pascal
ksi	kips per square inch	kPa	kilopascal
psi	pound-force per square inch	—	—
lb-ft ²	pound-force per square foot	—	—
Torque			
in·lbf	inch pound-force	N·m	newton meter
ft·lbf	foot pound-force	—	—
Energy, Heat, or Power			
A	ampere	A	ampere
C	coulomb	C	coulomb
—	—	F	faraday
Ω	ohm	Ω	ohm
V	volt	V	volt
W	watt	W	watt
—	—	kW	kilowatt
cal	calorie	J	joule
°	degree	°	degree
Btu	British thermal unit	K	Kelvin
—	—	mol	mole
Light			
cp	candlepower	cd	candela
cd/in. ²	candela per square inch	cd/m ²	candela per square meter
fc	footcandle	lx	lux
—	—	lm	lumen
Frequency			
Hz	hertz	Hz	hertz
mHz	megahertz	mHz	megahertz

Note: Always use the degree symbol for temperature. See [Section 8.8.1.2](#) for guidance on spelling out vs. using the degree symbol for angles.

Table 9.5.7.5-2. SI Prefix Abbreviations and Values

Prefix	Abbreviation	Value
tera	T	Trillion (10^{12})
giga	G	Billion (10^9)
mega	M	Million (10^6)
kilo	k	Thousand (10^3)
hecto	h	Hundred (10^2)
deca	da	Ten (10^1)
deci	d	Tenth (10^{-1})
centi	c	Hundredth (10^{-2})
milli	m	Thousandth (10^{-3})
micro	μ	Millionth (10^{-6})
nano	n	Billionth (10^{-9})
pico	p	Trillionth (10^{-12})

Note: Be careful not to confuse the prefixes starting with *m*.

9.6 Bibliography or Reference Lists

9.6.1 General

9.6.1.1 Position in Text

AASHTO technical publications usually include a bibliography or reference list at the end of each chapter or section. If, however, the bibliography or reference list applies to the entire book, the bibliography or reference list should be placed after the glossary but before the index.

9.6.1.2 Comprehensiveness

A single bibliography at the end of the chapter or book must include all references—sources with and without in-text citations. Materials standards have prominent “Referenced Documents” lists for references that have in-text citations and a separate list near the end for uncited, background references (see *AASHTO Materials Production Guidelines*).

9.6.1.3 List Order

9.6.1.3.1 Primary Sort: Author

All bibliographic or reference lists must be organized first (i.e. primarily sorted) alphabetically by the last name of the author. List a single-author entry before a multi-author entry beginning with the same name.

If the author is not known, use the name of the sponsoring organization as the author. If the sponsoring organization is not known, begin the entry with the title of the work and alphabetize accordingly.

Always list the name of the author(s). Do not use “Ibid” or dashes to replace the author’s name.

9.6.1.3.2 Secondary Sort: Chronology

Within each author subset (i.e. a single author, a multi-author group, or a sponsoring organization), list the items in chronological order with the earliest copyright first.

9.6.1.3.3 Example List

Here is an example showing the primary and secondary sort. The single author entry is first, then two multi-author entries in chronological order.

1. Carter, R. W. *Magnitude and Frequency of Floods in Suburban Areas*. U.S. Geological Survey Professional Paper 424-B. U.S. Government Printing Office, Washington, DC, 1971.
2. Carter, R. W. and J. Davidian. Discharge Ratings at Gaging Station. *U.S. Geological Survey Surface Water Techniques*, Book 1, Chapter 12. U.S. Government Printing Office, Washington, DC, 1965.
3. Carter, R. W. and J. Davidian. General Procedure for Gaging Streams. *U.S. Geological Survey Techniques of Water Resources Investigations*, Book 3, Chapter A6. U.S. Government Printing Office, Washington, DC, 1968.

9.6.1.4 Numbered Lists

If reference lists are numbered as in the example above, *do not* use these numbers as the text citations (callouts). Citation should be by author's last name and publication year.

For example, the following text references Section 9.6.1.3.3 example entry 2, Discharge Ratings at Gaging Station:

Discharge measurements at various stages at a site or gauging station provide data for developing a rating curve (Carter and Davidian, 1965).

The only exception to this is the Committee on Design's *A Policy on Geometric Design of Highways and Streets*, also known as the "Green Book," in which citations in the text appear as the reference's number enclosed in parentheses at the end of the sentence or clause in which the work is referenced. Italicize the reference's number, but not the enclosing parentheses or the closing punctuation.

9.6.1.5 Publication Date and Page Numbers

Note: Before 2017, books originating from the Committee on Bridges and Structures had a separate bibliographic convention wherein the publication date was placed immediately after the author's name. Starting in 2017, Bridge books conform to the style rule described herein.

The publication date (usually just the year) is often the last element in the entry. When specific page numbers are cited, follow the date with "p. x" or "pp. x–xx."

9.6.2 Elements to Be Included

The following information should be included in all bibliography or reference lists, in the order given:

- Author, last name followed by first name or initials;
- Any additional authors, first name or initials followed by last name;
- Title, including subtitle if necessary;
- Editor, compiler, or translator, if any;
- Edition, if not the first;
- Volume, total number of volumes if entire series is referenced, or number of volume if individual volume is being referenced;
- Title of individual volume, if applicable;
- Title of series, if applicable;

- Facts of publication—publisher, city, and date; and
- Page number(s), if applicable.

If authors' initials are used, set a space between them.

Samples of types of entries with the information written in the correct sequence and with the correct punctuation follow in [Sections 9.6.3](#) through [9.6.11](#).

9.6.3 Special-Case Transportation Authors

9.6.3.1 AASHTO Publications

9.6.3.1.1 General

For all AASHTO publications, use the acronym “AASHTO” in the author position and spell out the name in the publisher position.

For all AASHTO publications except individual materials standards:

- List all interims to date, if any.
- Include the publication code for current publications but not archived ones.
- Do not include the format suffix component of the publication code (e.g. (-UL, -CD, -WB).
- For archived publications, end the entry with “Archived.”

9.6.3.1.2 Example: Individual Standard (AASHTO’s and Others’)

AASHTO. M 43, Standard Specification for Sizes of Aggregate for Road and Bridge Construction. American Association of State Highway and Transportation Officials, Washington, DC.

9.6.3.1.3 Example: Archived AASHTO Publication

AASHTO. *Manual for Bridge Evaluation*. 2nd ed., with 2011, 2013, 2014, 2015, and 2016 Interim Revisions. American Association of State Highway and Transportation Officials, Washington, DC, 2011. Archived.

9.6.3.1.4 Example: Current AASHTO Publication

AASHTO. *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. 1st ed., with 2017 and 2018 Interim Revisions. LRFDLTS-1. American Association of State Highway and Transportation Officials, Washington, DC, 2015.

9.6.3.2 FHWA Publications

9.6.3.2.1 General

Set all titles in italics, including reports.

9.6.3.2.2 Example: FHWA Report

FHWA. *Guide for Selecting Manning’s Roughness Coefficients for Natural Channels and Flood Plains*. FHWA-TS-84-204. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, April 1984.

9.6.3.2.3 Example: FHWA Circular

FHWA. *Hydrology*. Hydraulic Engineering Circular No. 19. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, October 1984.

9.6.3.2.4 Example: FHWA Series

FHWA. *Highway Hydrology*. Hydraulic Design Series No. 2. FHWA-02-001. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, 2002.

9.6.3.3 TRB Publications

9.6.3.3.1 General

The Transportation Research Board publishes many types of publications. [Sections 9.6.3.3.2](#) through [9.6.3.3.6](#) give individual rules for each type as well as example entries.

9.6.3.3.2 Circular

Set series and title in italics.

Transportation Research Board. *Transportation Research Circular 191: Recommended Procedures for Vehicle Crash Testing of Highway Appurtenances*. Transportation Research Board, National Research Council, Washington, DC, February 1978.

9.6.3.3.3 NCHRP Report

Spell out NCHRP Report, follow by the report number and a colon, then follow with the title of the report.

Ross, H. E., Jr., D. L. Sicking, and R. A. Zimmer. *National Cooperative Highway Research Report 350: Recommended Procedures for the Safety Performance Evaluation of Highway Features*. National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 1993.

9.6.3.3.4 State-of-the-Art Report

Do *not* place quotes around the paper title; set the series in italics.

Kieselbach, R. Safety of Flawed Seamless Gas Cylinders. In *State-of-the-Art Report 3*. Transportation Research Board, National Research Council, Washington, DC, 1986, pp. 9–15.

9.6.3.3.5 Special Report

Do *not* place quotes around the paper title; set both the series and the report title in italics.

Ross, D. Ridesharing—Where Does It Go from Here? In *Special Report 60: Ridesharing Needs and Requirements: The Role of the Private and Public Sectors*. Transportation Research Board, National Research Council, Washington, DC, 1980, pp. 3–5.

9.6.3.3.6 Record

Do *not* place quotes around the paper title; set the series in italics. Do *not* include the Record title.

Baker, V. R. Paleoflood Hydrologic Techniques for the Extension of Streamflow Records. In *Transportation Research Record 922*. Transportation Research Board, National Research Council, Washington, DC, 1983.

9.6.4 Books

9.6.4.1 Single Author

Chow, V. T. *Handbook of Applied Hydrology*. McGraw-Hill Book Company, New York, NY, 1964.

9.6.4.2 Two Authors

Wisler, C. O. and E. F. Brater. *Hydrology*. 2nd ed. John Wiley and Sons, Inc., New York, NY, 1959.

9.6.4.3 Three or More Authors

1. Linsley, R. K., Jr., M. A. Kohler, and J. L. H. Paulhus. *Hydrology for Engineers*. 3rd ed. McGraw-Hill Book Company, New York, NY, 1982.
2. Fee, J. A., et al. *Interstate System Accident Research Study 1*. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, October 1970.

9.6.4.4 Books within a Series

Set the book title in italics; set the series title in italics only if the complete series is grouped under a specific title.

1. American Society of Civil Engineers. *Hydrology Handbook*, Vol. 2 of *Manuals of Engineering Practice*, No. 28. Prepared by the Hydrology Committee of the Hydraulics Division, American Society of Civil Engineers, Reston, VA, 1949.
2. Cooper, Craig O. and Thomas A. Wesche. *Stream Channel Modification to Enhance Trout Habitat under Low Flow Conditions*. Water Resources Series No. 58. Water Resources Research Institute, University of Wyoming, Laramie, WY, 1976.

9.6.4.5 Editor, Compiler, or Translator

1. Eliot, T. S. *Literary Essays*. Edited by John Jones. Prentice-Hall, New York, NY, 1980.
2. Jackson, John, ed. *Literary Essays*. John Wiley and Sons, New York, NY, 2003.

9.6.4.6 Parts of a Book

1. AASHTO. *Guidelines for Highways along Coastal Zones and Lakeshores*. Chapter 11 in *Highway Drainage Guidelines*. American Association of State Highway and Transportation Officials, Washington, DC, 2005.
2. Dalrymple, T. and M. A. Benson. *Measurement of Peak Discharge by the Slope-Area Method*. *U.S. Geological Survey Techniques of Water Resources Investigations*, Book 3, Chapter A2. U.S. Government Printing Office, Washington, DC, 1967.

9.6.4.7 Group (e.g., Organization, Association, or Corporation) as Author

AREMA. *Practical Guide to Railway Engineering*. American Railway Engineering and Maintenance-of-Way Association, Lanham, MD, 2009 or most current edition.

9.6.4.8 Obsolete or Disbanded Group as Author or Consultant

Highway Innovative Technology Evaluation Center (HITEC), a service center of the Civil Engineering Research Foundation (CERF). Group no longer active.

9.6.4.9 Government Agency as Author

For FHWA publications, see [Section 9.6.3.2](#). For TRB publications, see [Section 9.6.3.3](#).

U. S. Access Board. *Special Report: Accessible Public Rights-of-Way, Planning and Designing for Alterations*. Public Rights-of-Way Advisory Committee, U.S. Access Board, Washington, DC, August 2007.

9.6.5 Periodicals

9.6.5.1 General

Include the author's name (last name first), title of article in roman type, title of periodical in italic type, issue information (volume, issue number, date), and page reference.

9.6.5.2 Examples

1. Horner, W. E. Modern Procedure in District Sewer Design. *Engineering News*, Vol. 64, 1910, p. 326.
2. Summala, H., M. Rasanen, and J. Sievanen. Bicycle accidents and drivers' visual search at left and right turns. *Accident Analysis & Prevention*, Vol. 28, No. 2. Association for the Advancement of Automotive Medicine, published by Elsevier Publishing Co., Amsterdam, The Netherlands, 1996, pp. 147–153.

9.6.5.3 Digital Object Identifier (DOI)

A digital object identifier (DOI) is a permanent link to an article or document on the web to help readers easily locate a reference. If a DOI is provided, include it at the end of the reference entry, expressed as a URL using the syntax "doi.org/[DOI number]".

9.6.6 Technical Reports

1. Benson, M. A. Factors Affecting the Occurrence of Floods in the Southwest. U.S. Geological Survey Water-Supply Paper 1580-D. U.S. Government Printing Office, Washington, DC, 1964.
2. U.S. National Resources Conservation Service. Urban Hydrology for Small Watersheds. Technical Release No. 55, 2nd Edition. June 1986.
3. Fletcher, J. E., A. L. Huber, F. W. Haws, and C. G. Clyde. Runoff Estimates for Small Rural Watersheds and Development of a Sound Design Method. Research report prepared for the Federal Highway Administration by Utah State University. 1977.
4. Mar, B. W., R. R. Horner, J. F. Ferguson, D. Spyridakis, and E. B. Welch. Highway Runoff Water Quality. Research Project Report, E.E.S. Program, Department of Civil Engineering, University of Washington, 1982.
5. Wesche, Thomas. Parametric Determination of Minimum Stream Flow for Trout. Water Resources Series No. 37. Water Resources Research Institute, University of Wyoming, Laramie, WY, 1973.
6. California Department of Transportation. Long-Term Environmental Evaluation of Paint Residue and Blast-Cleaning Abrasives. California Department of Transportation, Sacramento, CA, July 1982.

9.6.7 Other Government Documents

9.6.7.1 General

See also [Section 9.6.3.2, "FHWA Publications,"](#) and [Section 9.6.3.3, "TRB Publications."](#)

9.6.7.2 Executive Orders

1. President's Commission on Law Enforcement and Administration of Justice. *Task Force Report: Juvenile Delinquency and Youth Crime*. Government Printing Office, Washington, DC, 1999.
2. President. Proclamation. "Caribbean Basin Economic Recovery Act, Proclamation 5142, Amending Proclamation 5133." *Federal Register*, Vol. 49, No. 2, January 4, 1984, p. 341.

9.6.7.3 Congressional Record

Congressional Record. 1930, Vol. 72, Part 10: 10828–30.

9.6.7.4 Hearings

Follow with the citation to the *Congressional Record* if possible.

U.S. House Science Committee, 108th Congress. *Hearing on H.R. 2551, Surface Transportation Research and Development Act of 2004*.

9.6.7.5 Bills and Resolutions

Surface Transportation Research and Development Act of 2004. 108th Congress, 2nd session. H.R. 2551.

9.6.7.6 Federal Register

1. President. Proclamation. "Caribbean Basin Economic Recovery Act, Proclamation 5142, Amending Proclamation 5133." *Federal Register*, Vol. 49, No. 2, January 4, 1984, p. 341.
2. 21 F.R. 623.

9.6.7.7 Code of Federal Regulations (CFR)

43 CFR 192.1.

9.6.7.8 U.S. Code (U.S.C.)

1. Declaratory Judgment Act. 1952. U.S. Code. Vol. 28, secs. 2201–02.
2. Act of August 5, 1953 (67 Stat. 588; U.S.C., title 18, sec. 1162).
3. Public Law 250, 84th Congress, 2nd sess. (67 Stat. 623).

9.6.8 Court Cases

In *Jones v. Robinson*, 122 U.S. 329 (1929).

9.6.9 Theses and Dissertations

Do not include quotes or italics.

Wacker, A. M. Highway Impact on a Mountain Stream. Colorado State University, M.S. Thesis, June 1974.

9.6.10 Conferences

9.6.10.1 Proceedings

Indicate where the conference was held, the publisher (association), location, and date; no quotes for the paper title; set proceedings title in italics.

1. Baker, V. R., et al. Long Term Flood Frequency Analysis Using Geological Data. *Proc., Canberra Symposium*, Canberra, Australia, IAHS-AISH Publication No. 128, December 1979.
2. Horner, W. W. and F. L. Flynt. *Relation between Rainfall and Runoff from Small Urban Areas*. Trans. ASCE, Vol. 101. American Society of Civil Engineers, 1936.

9.6.10.2 Presentation

Indicate where the conference was held, the publisher (association), location, and date; no quotes or italics for paper title.

Venuat, M. Effect of Elevated Temperatures and Pressures on the Hydration and Hardening of Cement. Presented at 6th International Congress on the Chemistry of Cement, Moscow, USSR, 1974.

9.6.11 Nonprint Materials

9.6.11.1 Slides and Films

Futures 2 with Jaime Escalante: Advanced Transportation. Foundation for Advancements in Science and Education, videocassette, 20 min., 1992.

9.6.11.2 Computer Programs

AASHTO. Roadside Safety Analysis Program (RSAP). In *Roadside Design Guide*. American Association of State Highway and Transportation Officials, Washington, DC, 2002.

9.6.11.3 Websites

Avoid using a lower-level URL that is likely to change over the lifetime of the citing publication. Referencing only the year the document was cited is acceptable if the year of publication is not provided.

1. Adams, A. et al. *Manual for Refined Analysis in Bridge Design and Evaluation*. FHWA-HIF-18-046. Federal Highway Administration, U.S. Department of Transportation, Washington, DC, May 2019. Available from www.fhwa.dot.gov/bridge.
2. FHWA. Computer software and related publications are available from McTrans, 512 Weil Hall, University of Florida, Gainesville, Florida 32611-2083. www.mctrans.ce.ufl.edu Telephone (904) 392-0378 or PC-TRANS, 2011 Learned Hall, University of Kansas, Lawrence, Kansas, 66045. Telephone (913) 864-3199.
 - HY 22. Urban Drainage Design Programs, Version 2.1, 1998.
 - HY 7. Bridge Waterways Analysis Model, (WSPRO), 2005. WSPRO Users Manual (Version 061698), 1998. FHWA-SA-98-080.
 - HY 8. FHWA Culvert Analysis (Version 7.1), 2008. Research Report (Version 1.0), 1987.
 - HYDRAIN. Drainage Design System (Version 6.1), 1999.
 - HYDRAIN. Users Manual, 1999.

9.7 Endnotes

9.7.1 Endnotes vs. Footnotes

AASHTO prefers that endnotes be placed at the end of each chapter or article. Footnotes are acceptable for reports and other less technical documents. Consult the Project Manager before using footnotes instead of endnotes.

9.7.2 Formatting

Endnotes or footnotes shall be designated with Roman numerals and numbered consecutively within each chapter or article.

Table or figure notes shall be numbered consecutively within each table or figure using either Roman numerals or lower-case letters. Superscript reference note numbers in citations and in the note lists themselves.

9.7.3 Citation Placement

A citation should be placed at the end of the sentence outside all punctuation marks except a dash.

9.8 Running Text Citations

9.8.1 Full Title Citation

If the full title of the work is cited, italicize the title. If a chapter or section of that work is cited, enclose the title of that section in quotation marks. For example,

- Recommendations can be found in AASHTO's *Roadside Design Guide*.
- See *AASHTO LRFD Bridge Design Specifications* Section 3, "Loads and Load Factors."

9.8.2 Author–Date Citation

Citations to endnotes should be in author/date format. These citations should be formatted as follows:

- *Single Author, Single Publication*—use a comma between author and date, e.g., "(FHWA, 2009)"
- *Single Author, Multiple Publications*—use a semicolon between author and date and a comma to separate dates of publication, e.g., "(FHWA; 2003, 2010)"
- *Multiple Authors, Single Publication*—use a comma to separate authors and dates of publication, e.g., "(Jones and Smith, 2010)" or "(Jones, Brown, and Smith, 2007)"
- *Multiple Authors, Multiple Publications*—enclose each publication within separate parentheses and include a space between each set of parentheses, e.g., "(Jones and Smith, 2010) (Jones, Brown, and Hammond, 2007) (FHWA, 2009)"

Annex A: Author/ Committee Resources

Follow the links below to view sample resources:

- [**A1 Request for Permission to Publish**](#)
- [**A2 Technical Publications Checklist**](#)
- [**A3 Technical Publications Promotional Information**](#)
- [**A4 AASHTO Blanket Photo Release**](#)
- [**A5 AASHTO Model Release**](#)
- [**A6 Transfer of Copyright**](#)

Word files of all these author/committee resources are attached to this guide. To view, click on the paperclip icon on the left side of the document window.

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AASHTO Technical Publications Checklist

THINGS WE WILL NEED WHEN BALLOTTED FILES ARE SENT

Confirmation of the Final Title

Make sure that this matches the ballot, or if they differ please indicate which one to use.

Text

Either all in one Word file or broken into several (by chapters/sections). See the *Style Manual for AASHTO Publications* for full detail on specific formatting for text and references.

- **Important Revisions Note:** Editorial changes may be made after balloting; technical changes need to go through the Committee's balloting process. Consult your Committee Liaison or Technical Committee Chair as to the nature of the edits, if necessary.
 - **Generally speaking, a change is considered editorial when: 1)** it corrects punctuation, spelling, format, font, etc.; **2)** the intent of an agenda item was not implemented (change accidentally not made, or a value is changed in several locations but is overlooked in one place); or **3)** it is a minor clarifying wording change, but material intent/application of the provision is unaltered.
- **Formatting Note, for Specifications Originating from the Committee on Bridges and Structures Which Include Commentary Only:** please have the text already formatted in two-column format, with the Text Specification on the left aligned with its corresponding Commentary on the right.
- As needed, copyright releases for AASHTO to publish the text (if in doubt, consult AASHTO Publications).

Front Matter

For example: Forewords, Acknowledgements, lists of non-AASHTO task forces that should be listed as authors (e.g., NSBA for the NSBA–AASHTO Collaboration specs)—including any updates to either from a previous edition, especially items such as “this Guide Specification is intended to supersede [other titles].”

- Committee Liaisons should provide appropriate Technical Committee listings

End Matter

For example: Appendices, Annexes, or Supplementary Requirements

Reference List

With running text citations in author–date format

- Example of author–date format: “(Rodriguez, 2019),” **NOT** “(Reference 2)”
- The AASHTO Committee on Design is the exception to this. They format their references as, for example, “(Reference 2).”

Graphics

High-resolution (150–300 dpi+) image files, separate from the Word file

- DXF, EPS, GIF, JPEG, PDF, PNG, TIFF, WMF files OK (**File Format Note:** AASHTO Publications staff do not have AutoCAD software installed, so we cannot read DWG files; AutoCAD files must be **exported** to EPS)
- Color or black-and-white OK (If in doubt, test print on your desktop or network printer to check image quality.)
- Editable text is preferred
- List exactly as the image source (organization?) wishes to be credited
- AASHTO Publications will need to prepare a permission letter for any figure that has been **previously published**, for example in a journal article, book, non-federal report, *published* thesis



AASHTO Technical Publications Checklist

THINGS WE WILL VERY LIKELY ASK FOR POST-BALLOTING

Completed AASHTO Technical Publications Promotional Information Form



AASHTO Tech_Pubs
Promo_Info_templat

Cover Graphics

Technically-appropriate high-resolution images for the cover of the publication, with completed Photo Release Forms for each.

- Note: Covers for the NSBA–AASHTO Collaboration are provided by NSBA; cover photos for the *Standard Specifications for Transportation Materials and Methods of Sampling and Testing*, and *AASHTO Provisional Standards* (a.k.a., the Materials Book) are gathered from AASHTO re:source when new ones are needed.



AASHTO Blanket
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- If there is already a designed cover from the author/contractor, we will also need the original files used to compile it and the font(s) used, as well as permission forms and any credit lines for those images (at a minimum, we are going to want to add an AASHTO logo and other publication information, such as the ISBN and AASHTO Publication Code)



Full Title of Publication:

AASHTO Pub Code:

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Name:

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<input type="checkbox"/> Administration & Economics	<input type="checkbox"/> Construction & Right-of-Way
<input type="checkbox"/> Asset Management & Planning	<input type="checkbox"/> Design & Traffic
<input type="checkbox"/> Bridges and Structures	<input type="checkbox"/> Highway and Street Design
<input type="checkbox"/> Bridge Design	<input type="checkbox"/> Transit Facilities
<input type="checkbox"/> Movable Bridge Design	<input type="checkbox"/> Traffic Control Devices
<input type="checkbox"/> Seismic Design	<input type="checkbox"/> Drainage
<input type="checkbox"/> Pedestrian Bridges	<input type="checkbox"/> Project Management
<input type="checkbox"/> Highway Signs, Luminaires, Traffic Signals	<input type="checkbox"/> Environment
<input type="checkbox"/> Fiber-Reinforced Polymer	<input type="checkbox"/> Practitioner's Handbook
<input type="checkbox"/> Tunnels	<input type="checkbox"/> Highway Transport & Trucking
<input type="checkbox"/> Allowable Stress	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Coastal Storms	<input type="checkbox"/> Materials Testing & Pavement
<input type="checkbox"/> Bridge Security	<input type="checkbox"/> Materials & Testing
<input type="checkbox"/> Bridge Construction	<input type="checkbox"/> Pavement
<input type="checkbox"/> Temporary Works	<input type="checkbox"/> Passenger Rail & Freight
<input type="checkbox"/> Wind Loads	<input type="checkbox"/> Reports
<input type="checkbox"/> Bridge Evaluation, Inspection, and Maintenance	<input type="checkbox"/> Finance
<input type="checkbox"/> Bridge Evaluation	<input type="checkbox"/> Administration
<input type="checkbox"/> Bridge Element Inspection	<input type="checkbox"/> Communications
<input type="checkbox"/> Movable Bridge Inspection, Evaluation, Maintenance	<input type="checkbox"/> Freight
<input type="checkbox"/> Bridge Welding	<input type="checkbox"/> AASHTO—AGC—ARTBA Joint Task Force
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	<input type="checkbox"/> Safety

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Parent/guardian: _____ **Date:** _____



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Title

Date

All authors, or in the case of a "work made for hire" the employer, must sign this agreement prior to publication of the work by AASHTO. (Use additional sheets as necessary.)

Please return by email to

Annex B: Editorial Resources

Follow the links below to view sample resources:

- [**B1 Copyedit Style Sheet**](#)
- [**B2 Proofreader's Marks**](#)
- [**B3 Preferred Spellings**](#)
- [**B4 Query Form**](#)
- [**B5 New and Revised Rigure Worksheet**](#)

Word files of the style sheet, query form, and figure worksheet are attached to this guide. To view, click on the paperclip icon on the left side of the document window.



Style Sheet for [Pub Code], [Title]

Preparer: _____


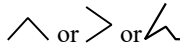

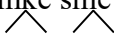










Date: _____

abcd	efgh
ijkl	mnop

qrst	uvwxyz
------	--------

Copyedit decisions:

Proofreader's Marks

Symbol	Meaning	Example
Operations (delete, insert, replace, transpose)		
	Delete	take it out
	caret to illustrate place of insertion	insert  here something
A	replace character or word	repl o ce "o" with "a" substitute different word
a //	make same correction consecutively as many times as slashes	m k e sm e correction 
/	used to separate two or more marks and often as a concluding stroke at the end of an insertion	thi d exampl y s/e
stet	let stand or ignore marked change	ignore marked correction
tr	transpose adjacent words or letters	change  of words tr an spose letters
	spell out	change  to five percent
X	broken character	de fective character
Q	query to author	Q Should 0.3 be changed to 0.03 or is it correct as is?
Spacing or Position		
	close up	print as  ne word
	delete and close up	de le te and close up
	insert and close up at left	insert and close up at left 
in 	insert and close up at right	sert and close up at right 

Symbol	Meaning	Example
[set farther to the left	[move to the left
]	set farther to the right	move right]
#	insert a space	insert a spacehere # ^
eq #	equalize space between words	equalize ✓ space between ✓ words
less #	less space between words	close up space between words ^ ^
ctr or] [center horizontally]center[
◇ or ∨	center vertically	◇ for a centered dot in $d \cdot r$
⌒	set as ligature (such as æ)	formulæ should be set as formulæ
=	align horizontally	<u> =align horizontally</u>
	align vertically	align verti- cally
□	indent or insert em quad space	
↓ or ⊥	push down or work-up	
# >	insert line space	# > <u>insert</u> line space
p # > or ()	delete or close up line space	p # > <u>delete</u> line space or delete () line space
Breaks		
¶	begin a new paragraph	start new paragraph. Here ^
↪	no new paragraph or new line	run) up
⌞	begin new line	begin new line <u>z</u> here
⌋	carry back to previous line	carry <u>back</u>)to previous line

Symbol	Meaning	Example
PgBrk	insert pagebreak	
NBS	set with nonbreaking space between words	Type Ctrl + Shift + Space bar to set nonbreaking space; e.g., 3 mm
Type		
cap	set in capitals	set <u>ben</u> as Ben
SM cap or S.C.	set in small capitals	set section as SECTION
lc	set in lowercase	set <u>Text</u> with lowercase <i>t</i> as text
ital	set in italic	set in situ in italic type as <i>in situ</i>
rom	set in roman	set <i>text</i> in roman type as text
bf	set in boldface	set text in boldface type as text
$\overset{2}{\vee}$	set as superscript	set 2 as superscript in ft ²
$\underset{2}{\wedge}$	set as subscript	set 2 as subscript in H ₂ O
Ⓔ	turn over an inverted letter	invert <u>a</u> d
wf	wrong font	wrong <u>size</u> or font
Punctuation Symbols		
= or \diamond or -/	hyphen	multi-colored
	en dash	1965–72
$\frac{1}{n}$ or <u>en</u> or / <u>n</u> /	em (or long) dash	Now—at last!—we know.
$\frac{1}{m}$ or <u>em</u> or / <u>m</u> /	em (or long) dash	
\diamond	comma	
\diamond	apostrophe	
Ⓒ	Period	
Ⓒ!	exclamation point	
/ or ;	semicolon	
: or Ⓒ	Colon	

Symbol	Meaning	Example
(()) or ()	quotation marks	
(/)	parentheses	
[/]	brackets	

Preferred Spellings

A

A (cap; ampere)
 acknowledgment
 air-entraining (adj.)
 air hole (n.)
 airtight (adj.)
 alignment
 alkali–silica (w/en dash)
 alloy-steel (adj.)
 a.m. (time)
 ambient-temperature (adj.)
 appendixes
 Article (in book; w/number)
 asphalt–aggregate (w/en dash)
 asphaltic
 assembly-marking (n.)
 at-grade (adj.)

B

backfill
 bankfull
 bevel (n./v.)
 bevelled (adj.)
 bicycle-safe (adj.)
 bidirectional
 blackout
 bollard (n.)
 bolthead (n.)
 bolthole (n.)
 bolt-tension (adj.)
 briquet
 brittle–ductile (w/en dash)
 broom (v.)
 Btu (initial cap only; unit of measure)
 built-up (adj.)
 buret
 bus-based
 bushhammer (n.)
 bus-oriented

C

calcined (adj.)
 cannot

carborundum
 carpool (n./adj.)
 centerbeam
 centerbeam/support-bar (adj.) (CS/BS)
 Certificate of Compliance (contractual)
 Charpy V-Notch (test)
 clean-cut (adj.)
 clean out (v.)
 clean-out (adj.)
 clean-up (adj./n.)
 cofferdam (n.)
 cold-draw (v.)
 cold-finish (v.)
 cold flow (n.)
 cold-forge (v.)
 cold-form (v.)
 cold-roll (v.)
 cold-swage (v.)
 cold-weather (adj.)
 committee (unless proper name)
 complete-joint-penetration (adj.)
 compressible-washer (adj.)
 constant-amplitude (adj.)
 continuous-beam (adj.)
 contract-documents (adj.)
 Constructor (contractual)
 Contractor (contractual)
 copper-alloy(ed) (adj.)
 coplanar
 countersink (v.)
 crandall
 cross section (n.)
 cross-sectional (adj.)
 crystallinity
 cutoff

D

day (sp out)
 dead-load (adj.)
 debonding
 decision maker (n.)
 decision-maker (adj.)
 decision making (n.)
 decision-making (adj.)
 degree(s) (sp out for angles)

deicing
 delaminate
 design–build (en dash)
 Designer (contractual)
 desilverize (v.)
 detensioning
 Direct Tension Indicator (DTI)
 disc (for CD-ROM discs)
 disk (all other uses)
 double-ply
 drier (comp. of dry)
 dryer (apparatus)
 DTIs (pl.)
 durometer

E

edgebeam
 e.g., (w/comma, for non-exhaustive lists)
 elastomer
 elastomeric
 electrolytically
 email
 embed
 embrittlement
 Engineer (contractual)
 ensure
 epoxy-bonded (adj.)
 epoxy-bonding (adj.)
 epoxy-coated (adj.)
 equidistant
 eyebar (n.)

F

Fabricator (contractual)
 fabric-substrate (adj.)
 factory-bonded
 factory-treated
 falsework
 fatigue-critical (adj.)
 fatigue-failure (adj.)
 fatigue-load (adj.)
 fatigue-test (adj.)
 fatigue-tested
 federal

ferritic
 field-connection (adj.)
 field-splice (v./adj.)
 field-welded (adj.)
 finishable
 five-sixths (etc.)
 flame-cut (adj.)
 floodwater
 floorbeam (n.)
 flow line
 foreword
 formwork
 four-fifths (etc.)
 fracture-critical (adj.)
 freeze–thaw (w/en dash)
 ft (foot/feet)
 full-length (adj.)
 full-penetration (adj.)
 full-size (adj.)
 full-width (adj.)

G

gauge
 glulam (glue laminated)
 gray
 grit-blast (v.)
 ground cover
 groundline
 groundwater

H

heat-cure (v.)
 heat-curve (v.)
 heat-straighten (v.)
 heat treat (v.)
 heat-treated (adj.)
 hertz (lc; unit of measure)
 high-density (adj.)
 high-friction (adj.)
 high-occupancy (adj.)
 high-range (adj.)
 high-performance (adj.)
 high-quality (adj.)
 high-speed (adj.)
 high-strength (adj.)

high-temperature
 high-yield-strength (adj.)
 highwater
 horsepower
 hot-bend (v.)
 hot-bond (v.)
 hot mix asphalt
 hot-weather (adj.)
 hour (sp. Out)
 Hz (cap.; hertz)

I

I-beam (non-breaking hyphen)
 i.e., (w/comma, for definitions
 or exhaustive lists)
 in. (inch/inches)
 indexes
 in.Hg (no space)
 in-service (adj.)
 insofar
 Inspector (contractual)
 Internet
 Interstate (highway)

J

joule (lc; unit of measure)
 judgment

K

K (cap; Kelvin)
 k (lc; SI prefix kilo)
 Kelvin (cap; unit of measure)
 kip (pl. kips; unit of measure)
 ksi

L

L (cap; liter)
 lateral–torsional (w/en dash)
 lb (pound/pounds)
 leakproof
 line-of-sight (adj.)
 liter
 live-load (adj.)

load-carrying
 load-indicating (adj.)
 load-indicator (adj.)
 load-test (v.)
 lock-pin (n.)
 long-distance (adj.)
 long-duration (adj.)
 long-lasting (adj.)
 long-term (adj.)
 low-alloy (adj.)
 low-carbon (adj.)
 low flow period (i.e., period of
 low flow)
 low-flow channel
 low-friction (adj.)
 low-occupancy (adj.)
 low-stress (adj.)
 low-temperature (adj.)
 low-pressure (adj.)
 low-water (adj.)
 lubricant-adhesive (n.)
 lubricant-sealant (n.)
 lump-sum (adj.)

M

M (cap; SI prefix mega)
 m (lc; SI prefix milli)
 machine-cut (adj.)
 magnesia (MgO)
 Manufacturer (contractual)
 mass-unit-price (adj.)
 match-cast (adj.)
 match-casting (n.)
 match-mark (v.)
 member (of AASHTO) /
 member (construction
 component; lc)
 metadata
 meter
 microsurfacing
 mid-depth
 mid-length
 mid-opening
 midpoint
 midrange
 midspan
 minute (sp. out)

mm
 mmHg (no space)
 moisture–density (w/en dash)
 movable
 MPa
 multiple-centerbeam
 multiple-support-bar (adj.)
 muriatic (adj.)

N

N (newtons)
 neoprene
 newton (lc; unit of measure)
 Newtonian (init. cap.)
 nonabsorbing
 noncoated
 noncommute
 noncritical
 nongelled
 nonmandatory
 nonmotorized
 nonparallel
 nonporous
 nonprestressed
 nonreactive
 nonredundant
 non-sag
 nonshrink
 nonstop
 nontransit
 nonyielding
 nonuser
 numerically-controlled (adj.)

O

off-peak (adj.)
 off-site (adj.)
 one-half (etc.)
 on-ramp (n./adj.)
 on-site (adj.)
 on-street (adj.)
 open-channel (adj.)
 opening-movement-vibration
 (adj.) (OMV)
 orthotropic-deck (adj.)
 out-of-round
 overall (adj./adv.)

overhang (n./v.)
 overlay (n.)
 oversize (v.)
 overtap (v.)
 overturn (v.)
 overtension (v.)
 Owner (contractural)
 oxygen-cut (adj.)

P

Pa (cap; Pascal)
 Pascal (cap; unit of measure)
 park-and-ride (adj.)
 percent (sp. out in text)
 pickup
 pipet
 plane (v.)
 plaster of paris
 plate-cut (adj.)
 p.m. (time)
 Poisson
 polychloroprene
 polyethylene
 polyisoprene
 polymer
 polymerization
 polystyrene
 polytetrafluorethylene
 polyvinyl
 poly(vinyl) chloride
 pond (v.)
 popout
 portland cement (lc)
 post-tensioning
 pourable
 pozzolan
 pozzolanic
 pphm (parts per hundred
 million)
 ppm (parts per million)
 preassembly
 precasting
 preemption
 preinstall (v.)
 premolded
 repositioned
 prequalify

prestress (n.)
 prestress (v.)
 Producer (contractual)
 proof-load (adj.)
 proved (past participle)
 proven (adj.)
 PTFE
 public–private partnership (en
 dash; abbreviation P3
 acceptable)
 pull-in
 pullout
 push-out
 PVC (poly(vinyl) chloride)

Q

quality-assurance (adj.)
 quality-control (adj.)
 quenched-and-tempered (adj.)

R

rad. (radians)
 radiant-heat (adj.)
 rail-based
 rail-oriented
 ream (v.)
 reinspect (v.)
 relubricated (v.)
 requench (v.)
 resistivity
 retemper (v.)
 retest (v.)
 retorque (v.)
 rideability
 right-of-way (lc, hyphenated)
 rights-of-way (pl. n.)
 rip-rap
 rotational-capacity (adj.)
 rotobroach cutters
 runoff
 run-out

S

sandblasting

sand–clay (w/en dash)	St. Venant's	troweled
sand–gravel (w/en dash)	subarticles	troweling
saw-cut (adj.)	subassembly (n.)	T-shaped (non-breaking hyphen)
scupper (n.)	subbase	Turner-Fairbank
seal-retaining	subcommittee (unless proper name)	turn-of-nut (adj.)
seal-weld (v.)	subdrill (v.)	2D (no hyphen; two-dimensional)
second (time; sp out)	subgrade	two-thirds (etc.)
Secretary–Treasurer (w/en dash)	subpunch (v.)	
Section (in book; contractual)	subsize (v.)	U
semilog (adj.)	substrate (n.)	unground (adj.)
service-limit (adj.)	sulfate	usable
service-load (adj.)	sulfur	usage
setback (n.)	Superpave (init. cap, no special char.)	
set-up (n./adj.)	supersede (v.)	V
sheet flow	support-bar (adj.)	vee (v.)
shop-splice (adj.)	swedge (v.)	very-high-slump (adj.)
shop-weld (adj.)	swivel-joint (adj.)	
short-term (adj.)	swivel-joist (adj.)	
silica (n.)		W
silt–clay (w/en dash)		waterproof
single-support-bar (adj.)	T	waterstop (n.)
single-ply	task force (unless proper name)	watertight
sinter (v.)	Teflon [®] (w/registered trademark symbol)	web/website
Skidmore-Wilhelm Calibrator	temperature-dependent	weldable
slip-critical	temperature-sensing	weld-repaired
S-N curve	tensile-strength (adj.)	weld-toe (adj.)
snug (v.)	tension-indicating	wheel-load (n.)
soffit (n.)	tension-indicator	wheel path (open compound)
soil–aggregate (w/en dash)	tension-measuring	width-to-thickness (adj.)
soil–cement (w/en dash)	thermal-cut	wire-brushed
soil–lime (w/en dash)	thought-out	
soiltight	3D (no hyphen; three-dimensional)	X
soil–water (w/en dash)	three-fourths (etc.)	x-ray (lc, all parts of speech)
solid-shank (adj.)	time-consuming	
solid-steel (adj.)	time-dependent	Y
spalling (n.)	tine (v.)	[No entries so far.]
Specifications (contractual)	torque (v.)	
state DOTs	torsional	Z
still water (n.)	traffic-calming (adj.)	[No entries so far.]
still-water (adj.)	traffic-loading (n.)	
stormwater	transferable	
straightedge (n.)	transit-friendly	
straightedging	transit-supportive	
strain-gauge (adj.)	tremie (n.)	
strain-measuring		
strength-failure (adj.)		
strength-limit (adj.)		
stress–strain (w/en dash)		

Requests for Files, Image Credit, and Copyright Status for Figures in AASHTO TP xxx (TS 2b)

Fig. No.	Excerpt Pg.	Caption	Photo or Drawing	Need File?¹	Source	Credit²	Contact Name Phone and Email	Need Permission Letter?³	Notes

¹ **File quality requirements:**

- *Drawing*— *Exported* EPS format or PDF format with fonts included. (We do not have AutoCAD.) Editable text preferred.
- *Photo*—JPEG, TIFF, or PDF format, 150–300 dpi; either color or black and white. (If in doubt, test print on your desktop or network printer to check image quality.)

² List exactly as the image source (individual or organization) wishes to be credited, if different from that shown in the Source column.

³ In almost all cases, AASHTO Publications will need to prepare a permission letter for any figure that has been **previously published**, e.g., in a journal article, book, non-Federal report, *published* thesis or dissertation, or another organization’s standard.

Annex C: Design Resource

The Publications Marketing Manager possesses this document as an interactive form. The designer (staff or contractor) will receive the completed form via email, indicating which marketing design items are needed for that project.

Marketing Design Specifications

PROJECT TITLE:

BANNER ADS

Banner Ad Type	Specs	Needed for this Project?
AASHTO Store Banner Ad	1110 x 250	
Transportation.org Banner Ad	1,500 x 480 pixels (“usable” (visible) area is 235 px tall window, starting at 145 px from the top.	
DTU/AJ Banner Ad (horizontal)	650 px x 90 px	
DTU Banner Ad (square)	300 px x 250 px	

VIDEO BUTTONS

Video Button Type	Specs	Needed for this Project?
Video Button Square	600 px (width) x 600 px (height) (72 DPI) PNG and JPEG formats	
Video Button Horizontal	507 px (width) x 285 px (height) (72 DPI) PNG and JPEG formats	

BOOK COVERS

Banner Ad Type	Specs	Needed for this Project?
Book Cover (Actual)	PDF, 8.5 x 11; no trim or bleed marks; a single page, no spreads.	
Bookstore Book Cover	JPEG, Size: 150 x 194 (no exceptions); Be sure that there is a discernable border around it, i.e., if the cover is white or light colored.	
Catalog Cover Book Cover	5.25 x 6.793	
Inside Catalog Thumbnail Cover	3 x 3.88, high res. Be sure that there is a discernable border around it, i.e., if the cover is white or light colored.	

Annex D: Administrative Resource

The interactive-form version of this document resides on the AASHTO headquarters network Pubs drive for internal use.

Closeout Worksheet for AASHTO Publications

Part 1: General Information

Publication Code

Publication Title

Project Manager's Name

Date

Part 2: Project Manager's Checklist

Electronic File Management:

Removed all *editorial* text file versions other than the final track changes and final clean copy.

Removed all *design* file versions other than the final version for both the text and the cover.

Saved important email correspondence to file.

Saved all electronic files from the network to thumb drive.

Hardcopy File Management—Inserted:

publication initiation form

official correspondence, such as permission to reprint letter

list of technical reviewers or chapter authors

technical review correspondence (especially responses to queries)

notes regarding problems or unusual procedures encountered during production

artwork

errata if any, including whether or not revisions were incorporated in electronic files

flash drive containing all electronic files

For Large Publications Only—Boxed:

original files (ballot and/or manuscript)

technical review correspondence (especially sign-off letters and responses to queries)

other noncontractual papers

Closeout File Handoff:

pubs jacket

boxes for offsite storage at GRM quantity

EMAIL TO PUBLICATIONS ADMINISTRATIVE ASSISTANT

Part 3: Publications Administrative Assistant's Checklist

Step 1—On Receipt of Email:

Notified fulfillment house and Support Services Center to remove previous editions of publication from stock

Notified Director of Publications, Store and Web Services Manager, and Publications Marketing Manager regarding transmittal of project

Reviewed printer invoice for accuracy and submitted as okay to pay to the Director of Publications

Step 2—Added to Flash Drive:

print specs report

print bid paperwork:

requests for estimates

submitted estimates

print award letter

unit cost sheet

pricing sheet

press notification sheet

fulfillment information:

inventory management form

AASHTO purchase order

box label

publication receiver report

transmittal information:

transmittal notification information

transmittal letter

transmittal release notification

sample box distribution sheet

printer invoice

electronic copy of printer files

copies of any contracts:

editorial consultant

design consultant

printing

joint development

sales agreement

Step 3—Distributed Books to:

appropriate AASHTO staff

SSC

Step 4—Wrap Up:

Filed for copyright

Stored two archive pub copies onsite

Shipped offsite:

Two archive pub copies

Project Manager's boxed files

Added previous edition to archived pubs list

Placed one pub copy in pub jacket (if size permits)

Reviewed pub jacket for completeness

PRINT FOR PUBLICATIONS JACKET

Annex E: Guidelines for Interims and Errata

E1 Guidelines for Interims

E1.1 Purpose

Interims are publications that generally disseminate substantive updates to publications between editions when those substantive updates are not numerous enough to create a new edition entirely. These are usually issued as PDFs with colored backgrounds.

E1.2 Layout

Interims are laid out as replacement pages. Replacement pages should always be created in pairs to facilitate double-sided printing, even if only one of the pages has changes.

Care should be taken to ensure that all replaced pages begin and end at the same places in the content as the original pages. If this is not possible, additional pages may be replaced before and/or after the replacement pages in order to align the replacements with the original text. These additional pages must be included in the interim as well. If adding large blocks of text, use point pages (e.g., “5-18, 5-18.1, 5-18.2, 5-19”) to avoid creating large numbers of pages with reflowed but otherwise unchanged content.

E1.3 Typography and Editorial Text

On replacement pages, inserted or changed text should be underlined. Deleted text should remain on the page but be struck through. If a new interim page replaces a page that already had been replaced in one or more previous interims, changes from all interims should be shown in the new page.

The title in the header of any replacement pages, including reflowed and verso pages, should be modified to show the title of the interim, usually by adding the phrase “[YEAR] Interim Revisions to the” to the beginning of the title.

The copyright footer on replacement pages should reflect the calendar year in which the interim is released (note that this may be different from the year in the title of the interim).

E1.4 Color Coding

Interim pages are identified with a background color. The first four interims for a publication follow a set color scheme for their backgrounds (while ensuring that the chosen tint is pale enough that, if printed in black and white, the shade of gray will have appropriate contrast with the text and figures on the page):

- Interim 1: pink
- Interim 2: blue
- Interim 3: yellow
- Interim 4: green

Subsequent interim background tint choices, when needed, are left to the Project Manager’s discretion, so long as they do not repeat previous interims’ colors and are readable if printed in black and white.

E1.5 Extremely Small Interims

Often, there are very few revisions, resulting in an extremely small interim. If the technical content is under 20 pages, the interim will be offered on its own for free digital download and transmitted as such. However, if the interim is to be added to the kit of a printed edition that already has other printed interims, this interim must be printed as well.

E2 Guidelines for Issuing Errata

E2.1 General

Although it is preferable to avoid having an erratum, sometimes technical corrections do need to be disseminated. When AASHTO is notified of an error or omission, the technical services liaison works closely with the subcommittee or task force responsible for producing the publication to issue the erratum in a timely manner.

E2.2 Producing Errata

1. The Project Manager prepares the full erratum with the following information in mind:
 - Each erratum should receive a new publication code (e.g., HSM-1-E1, HSM-1-E2, etc.).
 - Each new erratum should encompass all previous errata, using formatting to distinguish the previous errata's changes (e.g., bold, italic, highlighting, etc.).
 - If there is a print version of the publication, a notification letter should be created on AASHTO letterhead that includes the date (month and year only) and the publication code. The title at the top of the letter should state "ERRATA for [Name of the Publication]" in large, boldface type. The letter should also include a hyperlink to a copy of the full erratum located on AASHTO's website.
 - This letter will be set up as a kit with the book for the fulfillment house, then packaged and shipped with each order of the book.
 - A separate cover letter should be created for the full erratum. This cover letter should be on AASHTO letter head and include the date (month and year only) and the publication code. Also include any instructions, such as, "Text that appeared in previous errata is printed in bold." Use font characteristics, such as bold or italic type, font families, or color to highlight text in which special instructions apply. The title at the top of the cover letter should state "ERRATA for [Name of the Publication]" in large, boldface type. The cover letter should also include both an instruction to scroll down to see the full erratum and a hyperlink to download additional copies of the full erratum located on AASHTO's website.
 - For the full erratum, the cover letter is followed by a list of changes for the publication. The list is generally formatted in a 3-column table with rules only above and below the heading row. The first column lists the page number; the second column, the current text that needs to be revised; the third column, the revised text or reference to an attached page. The list may be further subdivided by chapter, volume, or section. The text in the second column should always specify the number of the section or article, table, figure, or equation where the change is to be made. The headers on these pages should include the publication code and the date of the errata. Page numbers may be placed in the header or footer.
 - The general rule of thumb is that (1) if the change is small, e.g., it refers to only a few sentences or a small equation, then the revised text or equation is listed in Column 3; or (2) if the change pertains to a large amount of text or table data, a long and complex equation, or a figure, then the Project Manager may summarize the change and refer the reader to the replacement page for the full text of the change.

- Replacement pages should be provided for each page with corrections.
 - Replacement pages should be created in pairs to facilitate double-sided printing.
 - New or changed text should be marked in some fashion (e.g., bold, italic, highlighted, etc.). Deleted text should be struck through.
 - Each replacement page should have a header stating “[Publication Code]-E[Erratum Number]: [Date] Errata to [Complete Book Title], [Year Published] Edition.” This should appear only on pages with changes. Verso pages with that are provided only for double-sided printing should not have this notation.
 - The copyright footer on replacement pages should show the date of the original publication, *not* the date of the errata.
2. The Project Manager incorporates changes from all errata into the design file of the document. Be sure to check and adjust any text reflow during this procedure.
 3. Each erratum file must be approved by the technical liaison before printing or release.
 4. When the final file is sent to press, the Project Manager notifies the Bookstore and Web Services Manager of the location of the PDFs of the erratum and all replacement pages.
 5. The Bookstore and Web Services Manager then updates all downloadable versions for AASHTO’s online store and resellers. These versions are not released until the printed errata are delivered to the fulfillment center. See Section 2.5.2.
 6. If applicable, the Bookstore and Web Services Manager sends the changes for web-based documents to the contractor. If necessary, the Project Manager may have to provide EPS or JPG files of revised figures.
 7. Finally, the Project Manager creates “PDFs for press” for the entire book in order to keep files up-to-date for future reprints.

E2.3 Distributing Errata

Distribution of errata includes the following:

- The fulfillment house emails 1 copy of the announcement letter to the original purchaser for each printed copy of the publication that has been sold to date (including transmittal copies).
- The Bookstore and Web Services Manager uploads all revised downloadable versions to AASHTO’s online store and resellers at approximately the same time that printed errata are shipped to the member departments.
- A printed copy of the erratum’s “announcement letter” must accompany all printed copies of the book when shipped.
- The Marketing Manager shall send an errata email notification to all previous purchasers. The text for this email can be a duplicate of the erratum’s “announcement letter.”
- The technical liaisons shall notify the participating subcommittee/task force of the erratum’s release.

E2.4 Reprints with Errata Corrections

Reprints of an AASHTO publication may include the changes listed in errata. In these cases, the subtitle “Second Printing” should appear under the date on the title page of the book.

The following statement should appear on the copyright page: “This reprint of the [book title] incorporates errata changes through [date].”

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