U.S. DEPARTMENT OF LABOR

Creating Section 508 Conformant PDF Documents

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Document Revision History

Version	Date	Author	Change Description
1.4	11/18/2019	OCIO	Added placement of footnotes and updated creating artifacts
1.3	6/21/2019	OCIO	Added instructions on displaying table cell options
1.2	5/16/2019	OCIO	Updated after OPA review
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Contents

Introduction

PDF files are created in a variety of ways, from a variety of applications, and for a variety of purposes. Achieving the desired accessibility goals for an individual PDF file requires understanding the nature of the PDF and its intended use. Adobe Acrobat Pro DC provides several tools including the **Make Accessible Menu** in the **Action Wizard** mode and the **Accessibility Checker** to assist authors in evaluating and fixing issues that can impact accessibility.

To make a PDF accessible to users of Assistive Technology (AT), you need to create an Accessible Tagged PDF. Most PDF files are created from files in other formats like Microsoft Word, Excel, and PowerPoint. If the original file was created accessibly and saved using the **Create PDF** function on the Acrobat tab, only a little additional work will be needed to create an accessible tagged PDF file.

Purpose

This guide is intended to help DOL employees and contractors create accessible PDF documents that are conformant with Section 508 requirements and best practices.

PDF Background

What Software is Required?

Adobe Acrobat is the industry-standard software for creating PDFs. You must have the professional version of Adobe Acrobat to remediate a PDF. This is different than Adobe Reader, which allows you only to read PDFs. The professional version allows you to modify the **tags** in the PDF.

What are PDF tags?

At the highest level, every document contains two things: content and structure. Content is what the document is about: the words, the pictures, the data, and the information. Structure is how the document is organized. If you can see, you understand structure immediately. You can tell that the word "Introduction" at the top of this page is a heading – because it looks like a heading and it's in the place where a heading should go.

In PDF, structure is defined through tags. It's the job of the PDF author to make sure that tags exist in the document, are correct, and are in the correct order.

How do Assistive Technology Users Read a PDF?

When the word "Introduction" is tagged as a heading, Assistive Technology will expose important qualities to users with disabilities. Screen reader users will hear not only the content (the word "Introduction"), but also the structure ("Heading Level 1"). They will also be able to navigate a document by using its headings – typically by pressing the H key.

Accessibility Options and Tools Setup

The **Accessibility Tools** and **Make Accessible Menu** option in the **Action Wizard** may not be visible when you open Acrobat DC. If they are not, see Accessibility Tool Setup section.

Converting to PDF Format

Start with an accessible source document. It should pass the accessibility checker and the DOL Section 508 checklist. In Word, PowerPoint, and Excel:
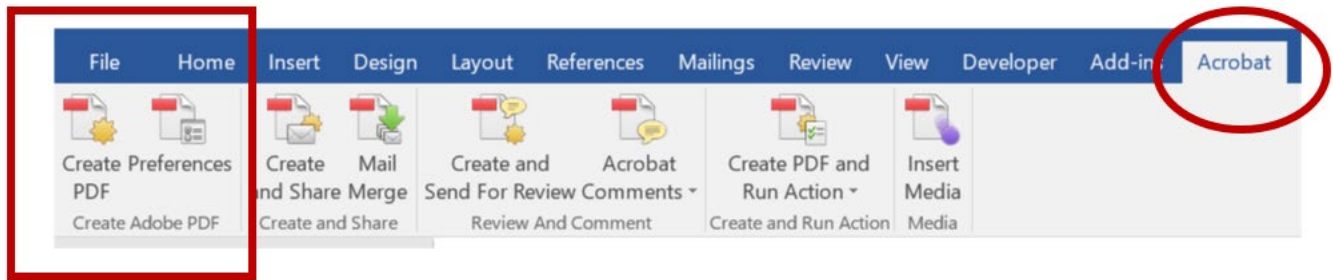
1. Select **Acrobat** tab
2. Select **Preferences**
3. Verify **Enable Accessibility and Reflow with tagged Adobe PDF** checkbox is checked
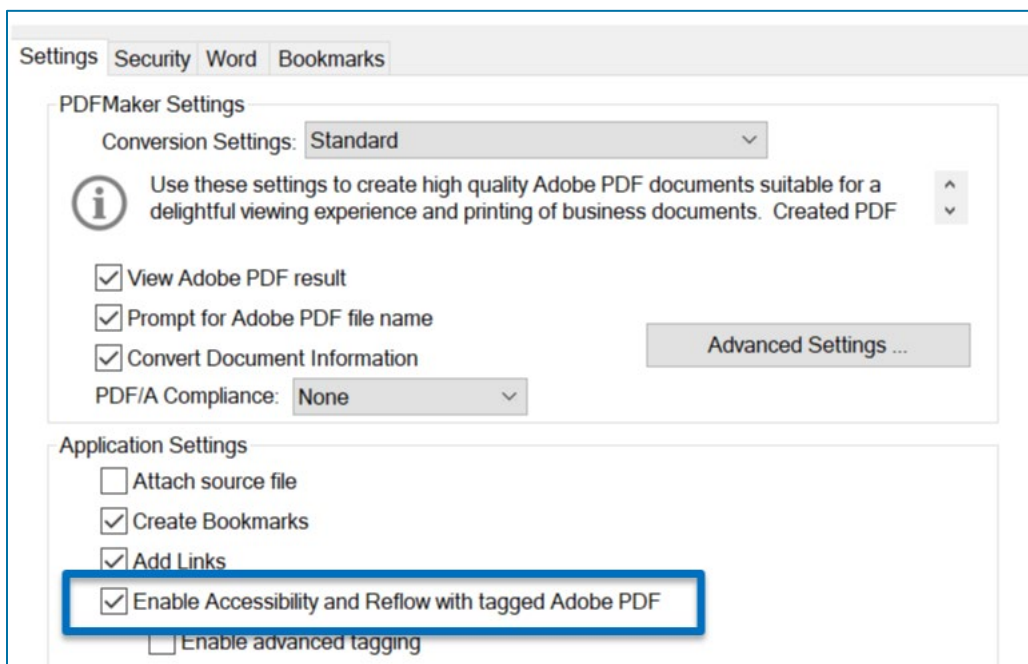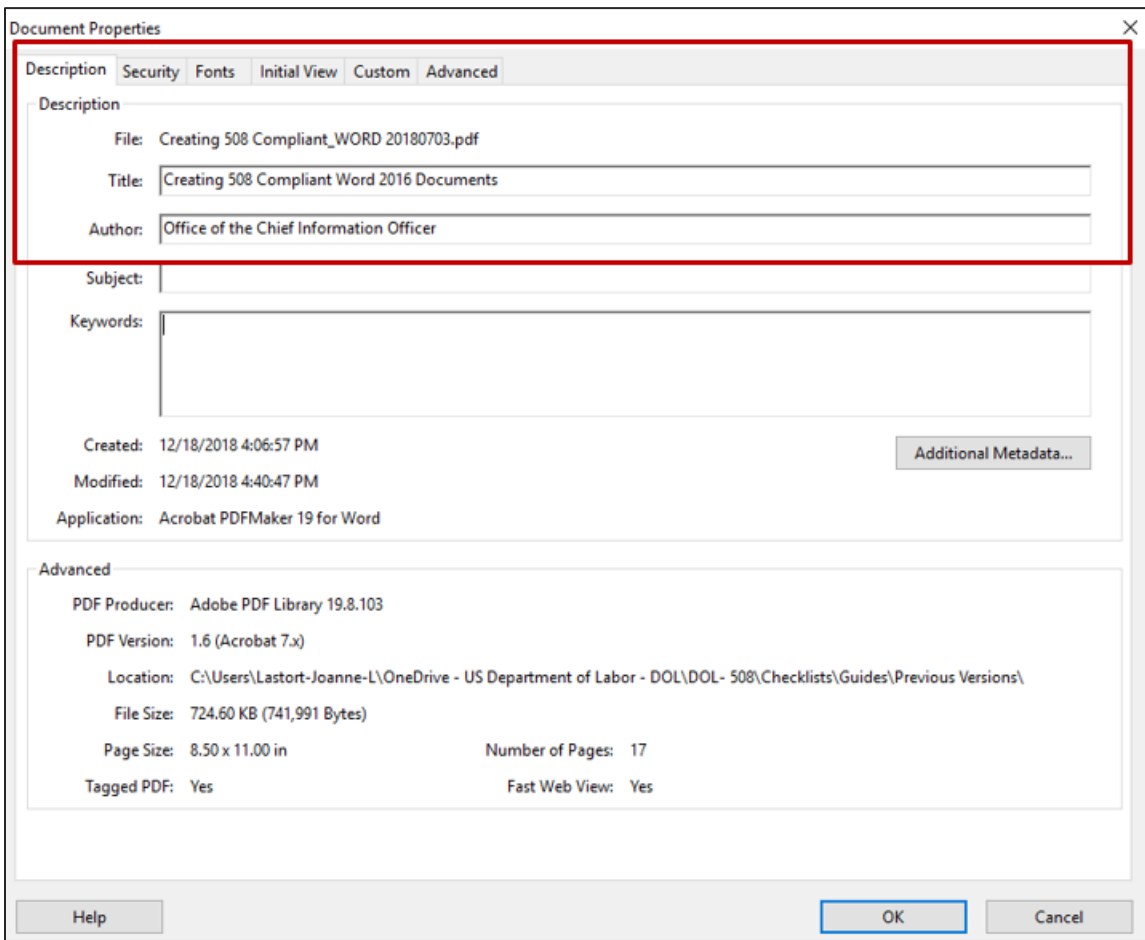4. Select **Ok**

Do NOT use the Saveas option! This doesn't keep the accessibility of the source document.

Set Document Properties

The document title, author, initial view, and language must be set as part of the document properties.

Title and Author

1. Select **File**
2. Select **Properties**
3. Enter **Title** (**Description** tab on **Document Properties** window). Title should be meaningful, not the file name
4. Enter document **Author** as "United States Department of Labor" or "AGENCY NAME, "United States Department of Labor."
5. Press **Ok**

Figure 3. Document Properties window – Description tab

Set Language

Set the appropriate language for the document.

1. Select **File**
2. Select **Properties**
3. Select **Advanced** tab
4. Select **Language** (in Reading Options section)

Figure 4. Document Properties window - Advanced tab - Set Language
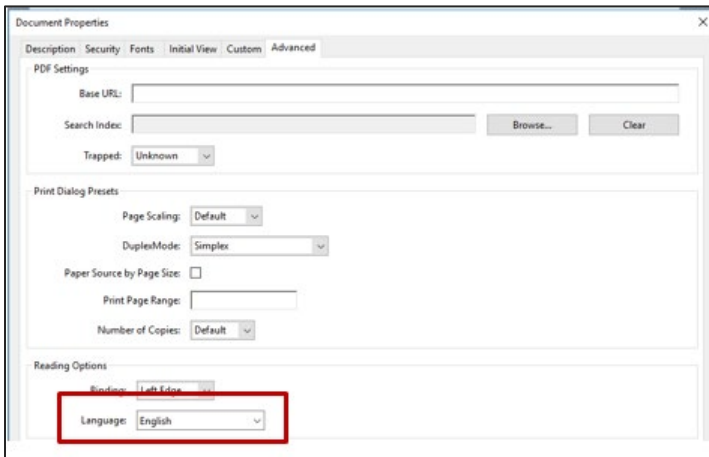
Set Initial View

Set the **Initial View** to Document Title so that the document title, not the file name will be read to the screen reader user.

1. Select **File**
2. Select **Properties**
3. Select **Initial View** tab
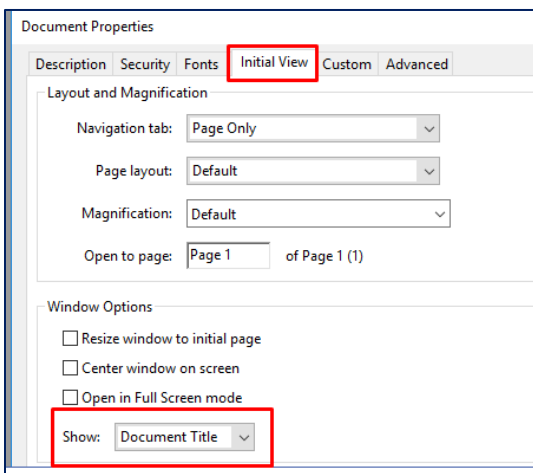4. Select **Document Title** (in Window Options section)

Figure 5. Document Properties window - Initial View tab - show document title

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Set Page Layout

Set the **Page Layout** to **Single page** or **Single Page Continuous**.

1. Select **File**
2. Select **Properties**
3. Select **Initial View** tab
4. Select **Page Layout** (in Layout and Magnification section)
5. Select Single Page or Single Page Continuous
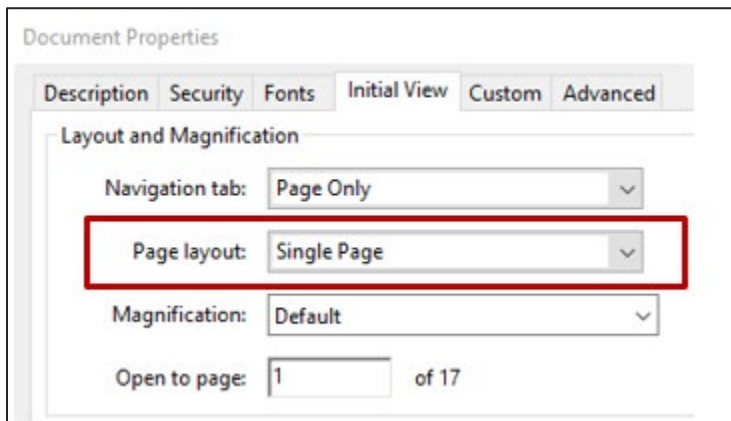
Figure 6. Document Properties window - Initial View tab - Page Layout

Content Copying for Accessibility Flag

Verify the **Content Copying for Accessibility** Flag is set to **Allowed** so that screen reader software can access the content.

1. Select **File**
2. Select **Properties**
3. Select **Security** tab
4. Select **Content Copying for Accessibility** (in Document Restrictions Summary section)
5. Verify it is set to **Allowed**
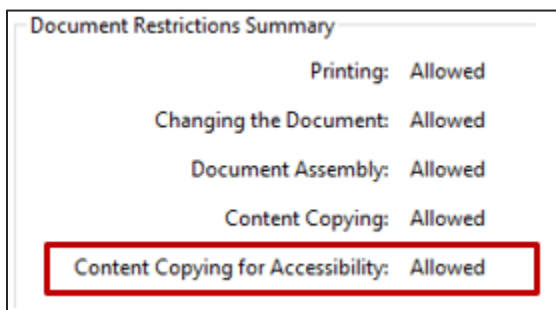
Figure 7. Content copying for accessibility

Accessibility Tools

The Accessibility Tools allow you to perform many accessibility functions such as **Set alternate text** (Alt text), access to the **Reading Order** tool, and the **Accessibility Checker**.

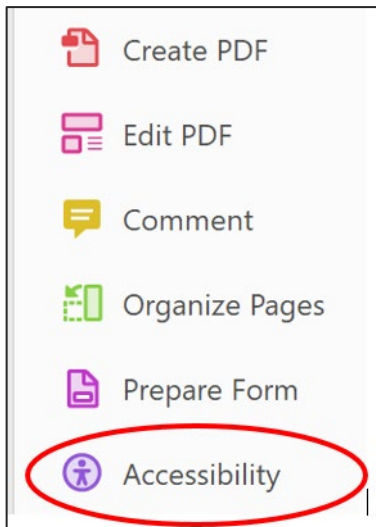The Accessibility Tools icon is found on the right-hand tool bar.

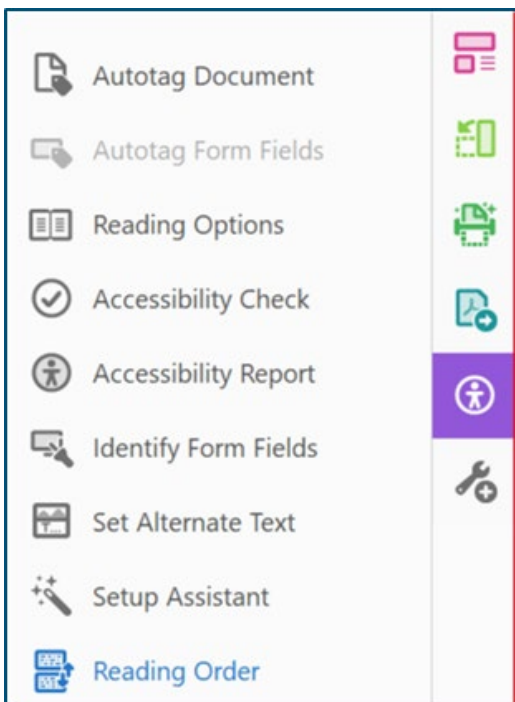**Figure 8. Accessibility tool icon**

List of Accessibility Tools

Figure 9. Accessibility Tools pane

Set Alternate Text Tool

The **Set Alternate Text** tool lets you enter the alternate text (Alt text) for **all** the images in the document at one time. You can also mark images as "decorative". If you have converted the document from Microsoft Word or another Microsoft Office product and added Alt text, it will transfer to the PDF document. If not, you will need to add it manually.

Alternate Text (Alt text)

Alternate text (Alt text) is important to assure people with disabilities are able to effectively use the information contained in images within the document. Alternate text (Alt text) allows Assistive Technology (AT) users to understand the images. All images that convey meaning need to be accompanied by Alt text, so that their purpose is communicated to people using Assistive Technology (AT).

For example, you are trying to demonstrate a technique to use during a storm, and you have an image of a single-family home with plywood over the windows. In your Alt text, the words "Boarded up house" convey more meaning and get to the intended purpose of the image more than just having the word "House."

Some best practices to keep in mind when writing Alt text include:

- Keep the text concise while still being meaningful and informative. Ask yourself if the text can stand alone—that is, it should act as an equivalent for the image if the image were to be removed.
- Don't use the terms "photo of", "image of", "picture of", etc., in the Alt text because AT users are told it's an image.
- Alt text for the Department of Labor seal should be: "**United States Department of Labor seal**".

Adding Alternate Text (Alt Text)

1. Select **Set Alternate Text** tool
2. Image will be highlighted
3. Enter alternate text (if necessary)
4. Select the **Next Arrow**
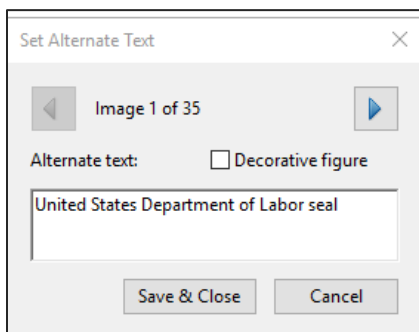5. Select **Save and Close** when finished

Figure 10. Set alternate text window

What about Decorative Images?

Decorative images are things like lines, or rectangles, or anything used for layout. They can also be images of things that are added to make the page look more interesting, like an icon of a calendar next to a calendar used to select a date. For these, check the **Decorative figure** checkbox.
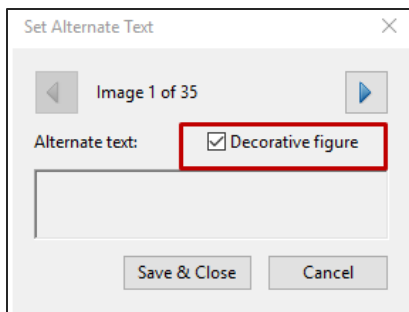
Figure 9. Set Alternate text window with checkbox checked

Accessibility Checker

The **Accessibility Checker** is a valuable tool in checking accessibility. However, just because your document passes the **Accessibility Checker** does NOT guarantee it is conformant. Use the checker more as a guide rather than a hard-and-fast rule. The **Accessibility Checker** cannot find all the issues. Some issues can only be found by a person. For instance, it can tell if there is no alternative text (Alt text), but it cannot tell if the alternate text (Alt text) makes sense.

The **Accessibility Check** option produces a report that is displayed on the left-hand side. Sections with errors are in bold text. Expand the section to see the individual errors. Selecting the error will highlight the element on the page that has the error. Review each error to correct it. When you click on the error, the object will be highlighted in the document. Right-click (or use the context menu key) and select **Explain** get an explanation of the error and how to correct it. Errors that need to be verified manually are marked.

1. Select **Accessibility Check**
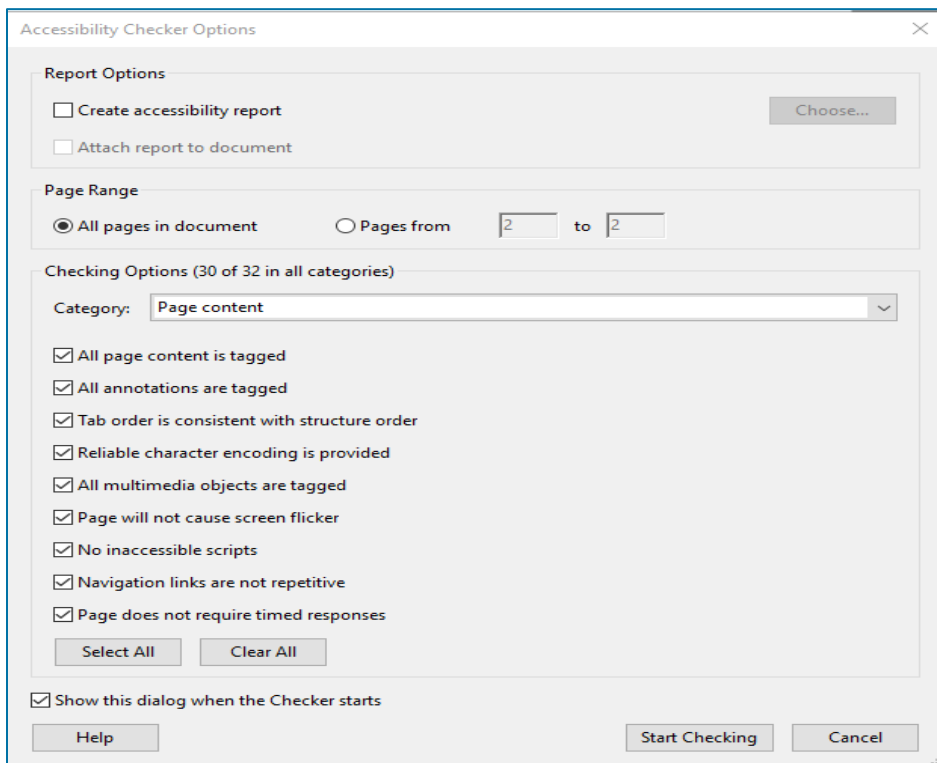2. Select **Start Checking** (to check all the options)

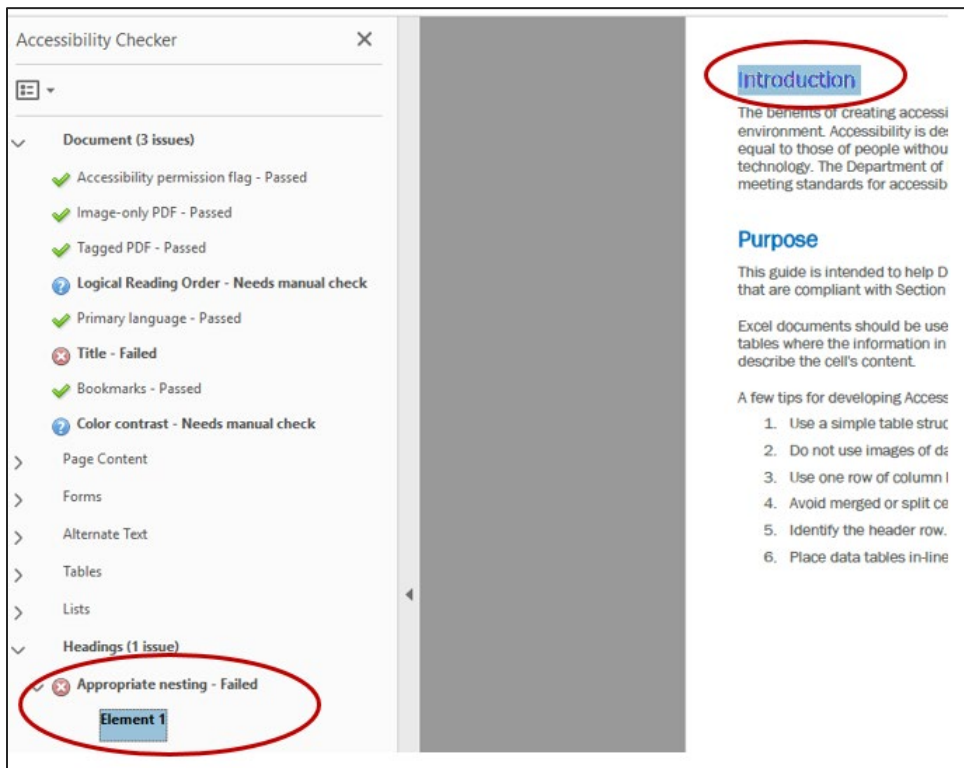Figure 10. Accessibility checker options

Figure 11. Accessibility report

Reading Order Tool

The **Reading Order** tool is for less advanced tasks than the **Tags** panel. For some things it is more efficient to use than the **Tags** panel. Select the **Reading Order** tool from the right-hand side panel. You can use the **Reading Order** tool to perform the following accessibility tasks:

- Remove nonessential content, such as ornamental page borders or formatting
- Correct or set structure types
- Fix the tagging of simple tables, and prepare complex tables for more advanced manipulation in the **Tags** panel

To perform advanced reading order and tagging tasks, such as fixing complex tables, removing obsolete tags, and adding alternate text to links, use the **Tags** panel. (See Tags Panel section.)

Warning: Save the document before you use the **Reading Order** tool. You can't use Undo to reverse changes made with this tool, so reverting to a saved document is the only way to undo such a change.

Make sure the **Structure types** radio button is selected so all the structures will be displayed.
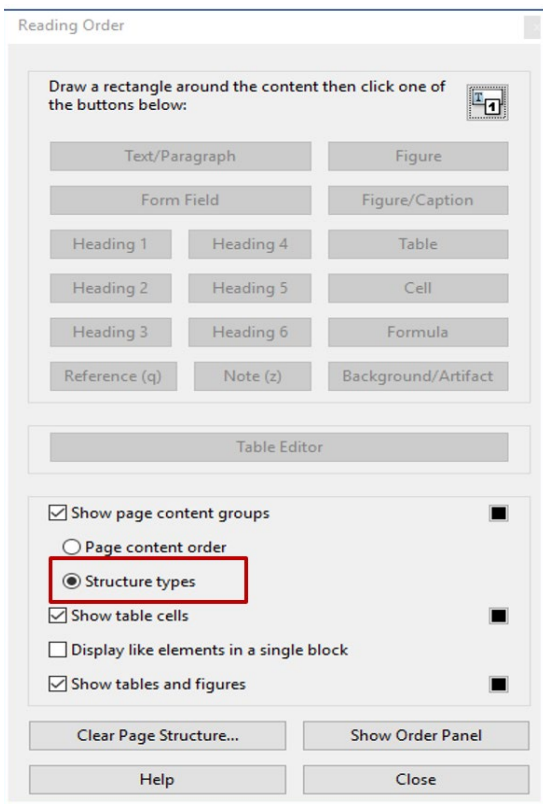

Figure 12. Reading Order tool window

When the **Reading Order** tool window is displayed, the structures appear on the document.
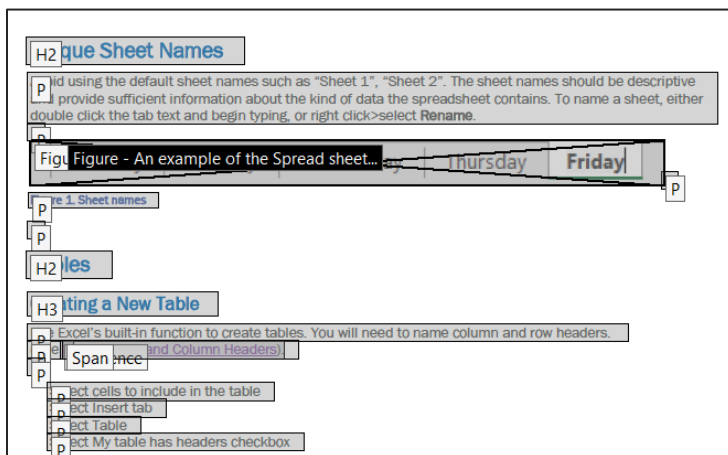

Figure 13. Structure types displayed

Creating Artifacts with Reading Order Tool

Use the **Reading Order** tool to identify and remove content that is not relevant to an AT user. Standard content that does not represent meaningful content, or appears as a background should be tagged as an artifact. Examples of such content in a document include decorative images or line spaces. Additionally, because they are not considered real content, artifacts are not present in the **Tags** Panel and so will not be read by a screen reader.

Content is removed by making it an **Artifact.** This removes it from the **Tags** which is what the Assistive Technology uses to read the document. (See How do Assistive Technology users use a PDF section.) When content is selected, it is highlighted in blue. Once it is selected, select the **Background/Artifact** button.
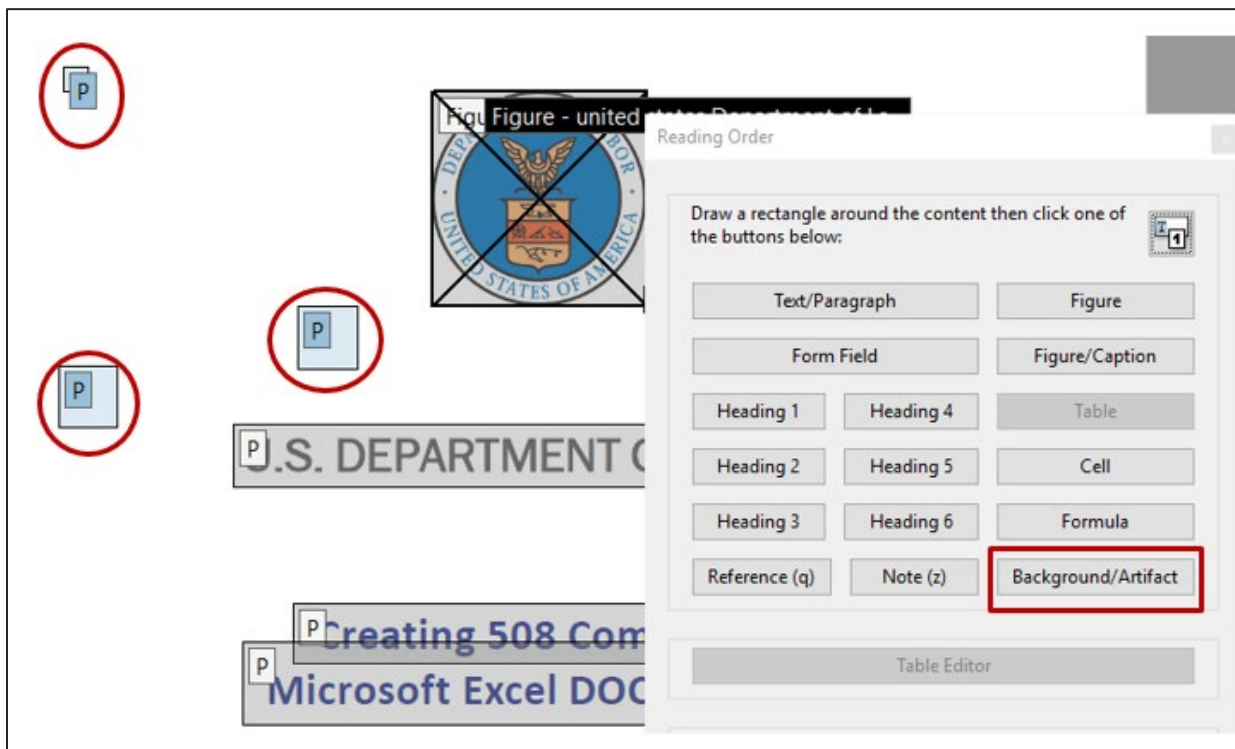

Figure 14 Example of formatting elements

Note: You can also remove nonessential content in the **Tags** Panel. See Creating Artifacts section.

Tags Panel

This is where you can see the structure of the document. Assistive Technology software uses the **Tags** to read the document. You can correct the reading order by selecting and dragging the elements to the proper place in the list. You can also edit or add tags.

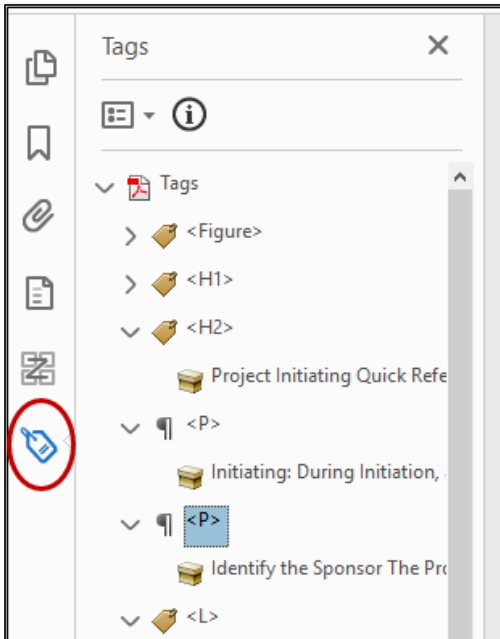To show the **Tags Panel**, press the **Tag** figure on the left-hand side menu bar.

Figure 15. Tags Panel

Common Tags

Tag	Description
<H1>	Heading level 1 (use for Title)
<H2>…<H6>	Heading levels 2-6
<P>	Paragraph (text)
<L>	List
<LI>	List item
<Lbl>	List label (1., 2., a. b., or bullets)
<LBody>	List body
<Table>	Table
<TH>	Table header
<TR>	Table row
<TD>	Table data cell
<Figure>	Image
<Link>	Link (and Link-OBJR)
<Note>	Footnote/endnote text
<Reference>	Table of Contents entry, page number, subscript
<Document>	Document
<TOC>	Table of Contents
<TOCI>	Table of Contents item

Tables

Tables pose a special challenge for screen readers because they present textual or numerical data to be easily referenced visually. Content within table cells can be complex and might contain lists, paragraphs, form fields, or another table.

There are two types of tables: data tables and layout tables. To be Section 508 conformant, data tables must have their column and row headers identified and layout tables should not be used. It is very difficult to create accessible complex tables. Examples of complex tables include those with row and column headers, multiple rows of headers, and headers that are both row and column headers. In general, complex tables should be avoided.

Format Tables

Tables created accessibly in Word should still be checked for proper formatting. Tables that have row headers or headers that are both for columns and rows need to be formatted. Tables are formatted using the **Reading Order Table Editor**.

The **Reading Order Table Editor** tool displays the selected table into cells and allows the user to apply additional table markup. Most tables are properly recognized using the **Table Editor**; however, the tool may not recognize a table that lacks clear borders, headings, columns, and rows. Use the **Table Editor** to check and correct table tags. By viewing table tags, determine whether columns, rows, and cells have been correctly identified. Tables that lack well-defined borders and rules are often tagged incorrectly or contain adjacent page elements. It is possible to correct poorly tagged tables by selecting and redefining them; it is possible to split combined cells by creating a tag for each cell.

1. Select the **Reading Order** tool
2. Select the **Show Tables And Figures** button
3. If the table is not clearly labeled in the document pane, drag to select the entire table, and then click **Table** in the dialog box
4. Select **Show Table Cells** to make sure that all cells in the table are defined as individual elements.

If cells do not appear as separate elements:
1. Use the **Reading Order** tool to select a single cell from within a merged cell
2. Select the **Cell** button in the dialog box
3. Repeat for each split or merged cell

TH Current Assets	TH		2016	TH	2017
TD Cash	TD	$	11,000	TD	10,000
Ac TD ints receivable	TD	$	500	TD	300
TD Inventory	TD	$	200	TD	100
TD Prepaid expenses	TD	$	300	TD	300
TD Short-term investments	TD	$	1,000	TD	800
TD Total current assets	TD	$	13,000	TD	11,500

Figure 16. Example of table with merged cells

Table Editing Mode

1. Select the **Show Order Panel** button in the **Reading Order** dialog
2. Highlight a cell from the table in the **Order** panel
3. The **Table Editor** button in the **Reading Order** tool becomes active
4. Select the **Table Editor** button on the **Reading Order** dialog to place the table in **Table Editing Mode.** Header cells are indicated with **<TH>**. Data cells are indicated with **<TD>**.

TH Innovation	TH Technology
TD computer file could be printed exactly as it appeared on screen, with all formatting, graphics and fonts intact	TD dobe Postscript(r)
TD defined the quality and complexity of images that could be created for print, and later extended those benefits to content created for video, film, web, and alternative computing devices	TD dobe Illustrator(r) Adobe Photoshop(r)
TD ange page layout market	TD dobe InDesign(r)
TD abled formatted digital document sharing across platforms	TD dobe Acrobat(r) Adobe(r) Portable Document Format (PDF)
TD eatly enhanced how people create, manage, deliver and engage with information	TD dobe(r) Engagement Platform

Figure 17. Table Editing Mode

Selecting Table Cells

Select individual cells by clicking within the borders with the mouse. When the cell has been selected, it will have a green border. Select multiple table cells by holding down Shift and clicking. (This is an efficient method for selecting the first row of data cells in a table which need to be changed to header cells.) Some properties for multiple cells can be set at once thus saving time tagging large and complex tables.

TH rrent Assets	TH	TH 2016	TH 2017
TD Cash	TD	$ 11,000	TD 10,000
TD Accounts receivable	TD	$ 500	TD 300
TD Inventory	TD	$ 200	TD 100
TD Prepaid expenses	TD	$ 300	TD 300
TD Short-term investments	TD	$ 1,000	TD 800
TD Total current assets	TD	$ 13,000	TD 11,500

Figure 18. Example of selected cell

Edit Cell Properties

Once in **Table Editing** mode, right click to display the **Table Cell Properties** dialog.
Use the **Table Cell Properties** dialog to:

- Specify the type of a table cell (Header cell or Data cell)
- Set cell attributes that span more than one row or column
- Assign a scope of row, column, both, or none to header cells
- Assign a unique header ID for Table Headers
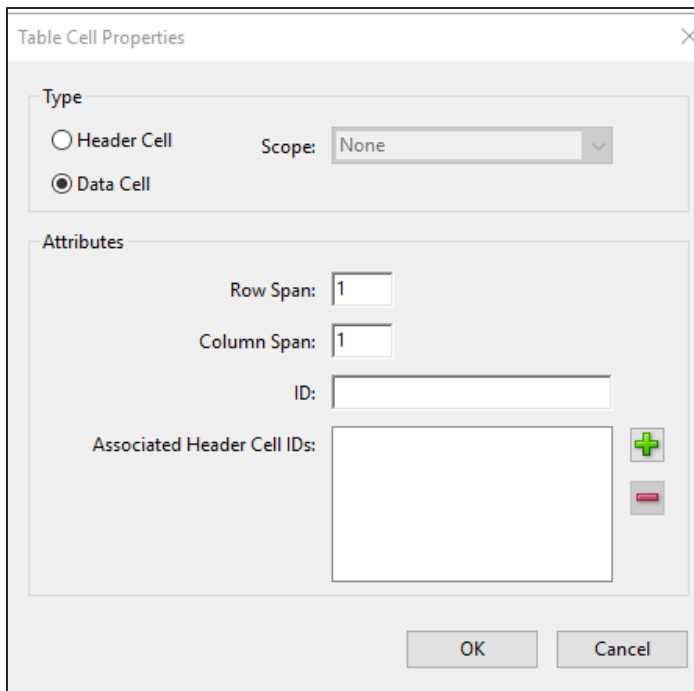- Associate Data cells with Header IDs that have been created for the table

Figure 19. Table cell properties

Note: If the TH and TD are not visible, you will need to change the options in the Table Editor.

1. Right-click (or use the context menu key) on any table cell
2. Select **Table Editor Options**
3. Check **Show cell type (TH or TD)** checkbox (Label Option)

Verifying Table Structure with the Tags Panel

Use the **Tags** panel to check the structure of the table. See Tags Panel section.
1. In the **Tags** panel, expand the tags root to view a table tag
2. Select the table tag **<Table>** and verify that it contains

   Table Rows <TR>, each of which contains **Table Header <TH>** or **Table Data <TD>** cells

Do one or more of the following:
- If the tags for the table doesn't contain these elements, but rows, columns, and cells appear in the table in the document pane, use the **Reading Order** tool to select and define the table or individual cells.

- If the table contains cells that span two or more columns or rows, set **ColSpan** or **RowSpan** attributes as appropriate for these cells in the **Table Editor** of the **Reading Order** tool.
- Re-create the table in the authoring application, and then convert it to a tagged PDF.
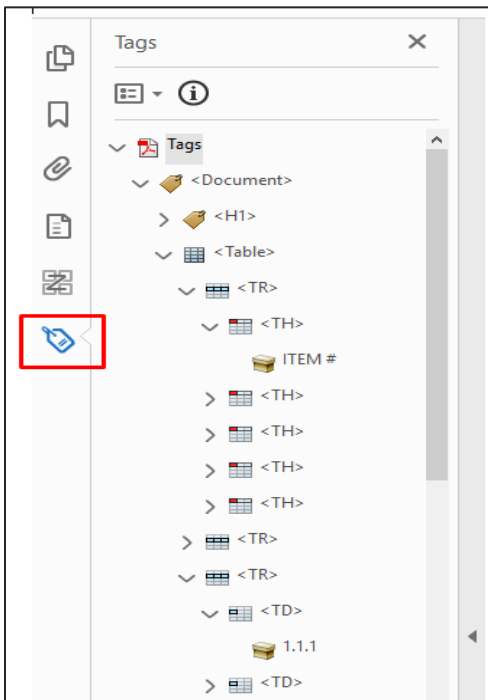

Figure 20. Table structure in Tags Panel

Page Content Order

You can check the order that the elements on the page will be read in by selecting each tag with the mouse. When a tag is selected, the corresponding element will be highlighted on the page. Step through each tag and verify it is in the correct order on the page.

Figure 21. Selected content displayed

Correcting Content Order

Correct the order by dragging the tags into the correct order with your mouse.
Note: Do **NOT** use the **Order** panel because the Assistive Technology uses the **Tags** for structure and order, **not** the Order panel.

Creating Artifacts with the Tags Panel

You can also remove nonessential content in the **Tags** panel by changing the tag to **Artifact**. Checking the content order using the **Tags** panel, you can see nonessential formatting elements displayed as shown below.

Figure 22. Formatting element in document

In the **Tags** panel, the formatting element looks like this.

Figure 23. Formatting element in Tags panel

To remove it from the **Tags** panel, there are two parts. Change the tag to Artifact and then delete the now empty tag. The empty tag has no **>** next to it.

Part 1 – Change tag to Artifact:

1. Select tag
2. Right-click (or use the context menu key) to open menu
3. Select **Change Tag to Artifact** (**Create Artifact** window opens)
4. Select **Ok** (Page radio button is automatically checked)

Figure 24. Create artifact

Part Two - Delete empty tag

1. Select empty tag
2. Right-click (or use the context menu key) to open menu
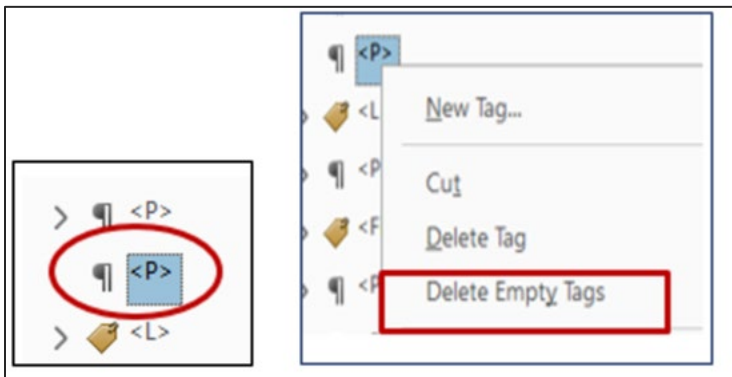3. Select **Delete Empty Tags**

Figure 25. Delete empty tags

Lists

In Adobe Acrobat, each list structure must consist of a parent **<L>** tag and subsequent list item **<LI>** tags for each item in the list. If there are total of eight items listed, then there needs to be eight **<LI>** tags in the structure. Each list item **<LI>** tag should contain a label **<Lbl>** tag that includes the number or bullet and a list item body **<LBody>** tag that contains the text of the item.

Figure 26. List tags

If there is a sub-list or nested list, it must be nested under the <LBody> tag of the parent list.

Figure 27. List structure with sub-list

Table of Contents

If you have created a **Table of Contents** accessibly in Microsoft Word, you will not have to do much work to it in the PDF file. You may have to nest sub-headings and get rid any extra blank tags.

The structure of Table of Contents tags are as follows:
> **<TOC>**
>> **<TOCI>**
>>> **<Reference>**
>>> **Link - OBJR**

Figure 28. Table of contents tag structure

1. Each item in a **Table of Contents** needs to have proper **Table of Contents** structure. The **TOC** tags open with a **<TOC>** tag. Each item has a **<TOCI>** tag, followed by a **<Reference>** tag, followed by a **<Link>** tag, and then followed by the content for that link.

2. The hierarchy of the **Table of Contents** is very important. Not every **TOC** item is on the same heading level, so this needs to be reflected in the tags. Sub lists need to be nested within the corresponding parent tag.

Footnotes

This is one case in which the visual order does **not** match the order in the **Tags Panel**. The placement of the **<Note>** tag depends on where it is.

1. Place the **<Note>** tag in the Tags tree (in a **<P>** tag), immediately after the Paragraph tag that references it. When a list refers to a note, move the <Note> tag inside the <LBody>, placing it after the text in the **<LBody>**.
   - The advantage of this choice is that it places the note text closer in the reading order to where it is referenced.
   - If the same footnote is used to more than once in a document, do not use this option.

2. Do not move **<Note>** tags inside **<TH>** cells in data tables. If a footnote is referenced in a table's header cell, add the note in a Paragraph tag below the table in the Tags tree.

3. Place the **<Note>** tag (in a **<P>**) as the last tag for the page where it appears in the physical view.
   - Use this option if the same footnote is referred to multiple times on the page.
   - **Caution:** If a paragraph or list item spans across multiple pages, do not break the Paragraph, **<LBody>** or List tag at the end of one page to insert the Note tag before the page break. Instead, move the **<Note>** tag after the Paragraph tag, even if it means the note appears on the following page.
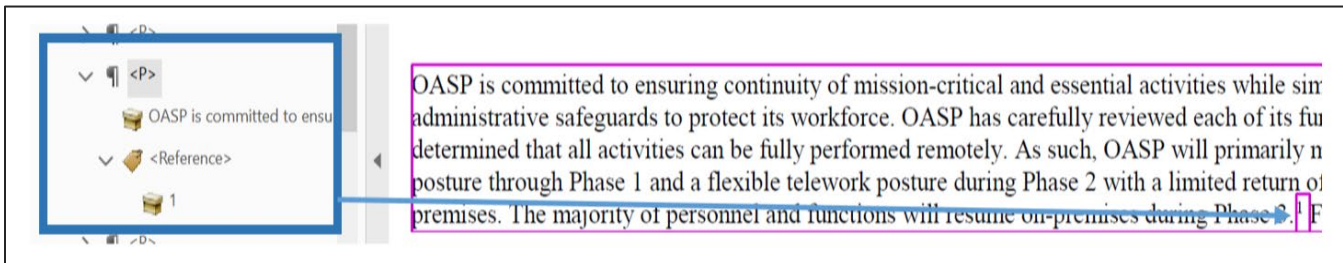

Figure 30. Example of text with footnote number

Figure 31. Example of footnote structure

Links

The **<Link> t**ag identifies to the Assistive Technology users that the tag contains a link. Having the proper role as **<Link>** identified is important so the Assistive Technology users can determine how to interact with the content. For a link to be structured and identified properly, the **<Link>** tag needs to contain the text of the link along with a **Link-OBJR** tag. **OBJR** stands for "Object Reference", and is basically the action for that link. The **OBJR** is what makes the link different from normal text.

Figure 32. Example of Link tag

To ensure the link is identified and given the proper action:

1. Locate the tag containing the visual link text in the **Tags Panel**. (See Tags Panel section.)
2. Highlight the parent tag of the link text
3. Change the parent tag to a **<Link>** tag
4. Ensure the link has been activated (Press the Add or Edit link button to reveal links throughout the PDF)
5. Locate the tag containing the visual link text in the **Tags** pane (This will allow the tag to be placed in relation to its link text.)
6. Right-click (or use the context menu key) and select **Find**
7. In the **Find Element** dialog, select **Unmarked Links** from the **Find** combo box and select **Find Next**
8. When the link in question is highlighted in the main document by a blue rectangle, select the **Tag Element** button
9. Select **Close**
10. Confirm a **Link-OBJR** tag has been placed with the **Link** tag

Figure 33. Find element window

Adding Alternate Text (Alt text) to Links

Whether the visual text or a raw URL link needs clarification, alternate text can be applied so that the Assistive Technology user will be able to access more useful information. Alternate text for links is just as easy as adding alternate text to other elements, such as images.

1. Select the **link** in the **Tags** Panel that needs to be updated
2. Right-click (or use the context menu key) and select **Properties**
3. Add text to the **Alternate Text** edit field. Meaningful and concise alternate text should not be more than 250 characters

Figure 34. Adding alt text to links

Color

Color Contrast

The color contrast ratio between the text and the background is important. If it is too low, some people will not be able to read the text. The Section 508 color contrast standards require a **minimum** ratio of 4.5:1.

To test color contrast, you can use an on-line tool, such as the Color Contrast Checker. Just enter the foreground (text) and background colors in either hexadecimal or RGB format. The contrast ratio is displayed. To change the ratio, click on the slider bar.

Figure 35. Color contrast checker

Another tool, which would need to be installed by your tech team, is the Color Contrast Analyzer.
Enter a foreground (text) and background color in RGB or hexadecimal format (e.g., #FD3 or #F7DA39) or choose a color using the dropper tool to select the foreground and background.

Figure 36. Color Contrast Analyzer

Color Conveying Meaning

Section 508 requires that when color is used to indicate meaning, direction or other information, that same meaning be provided in a way that does not use color. The form pictured below has three required fields. The required fields are in red. Someone who is colorblind (or blind) might not be able to tell which fields are red. However, this form is Section 508 conformant: the required fields are also marked with an asterisk (*) – and the form instructions indicate that required fields are marked with an (*).

Figure 37. Example of use of color and alternate method

OCR

OCR stands for **Optical Character Recognition**. OCR converts pictures of text into editable text. If the document is a scanned PDF, then OCR will need to be run on the document.

1. Open the PDF file for which you want to run OCR
2. Open **Tools**>**Text Recognition**>In this file
3. A **Recognize Text** dialogue box will open. Choose your page preferences and select **OK**
4. The OCR process will start. It will take some time, depending on the number of pages in the PDF
5. Use the **Reading Order** tool to check the page structure

Accessibility Tools Setup

The Accessibility Tools and Make Accessible Menu option in the Action Wizard may not be visible when you open Acrobat DC.

1. Select **Edit**
2. Select **Manage Tools**
3. Select **Accessibility**
4. Select **Add**
5. Select **Action Wizard**
6. Select **Add**