U.S. Department of Defense Section 508
Connecting Individuals with Information

PDF Accessibility Guide

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I.   Preparing your workspace in Adobe Acrobat Professional

The first time you tag a PDF for accessibility there are a few steps you'll need to take to set up your workspace. These steps only need to be performed once:

1. Open a PDF
2. On the very left edge and halfway down the screen, click the small arrow to expand the **Navigation Pane** if it isn't already expanded.
3. You will need to add a few icons to the list of defaults. To do this, right click in the empty space below the existing icons and select **Tags**. Repeat the previous steps and add **Content**. This will add the two new icons to the list.
4. From the Tools menu on the right side of the screen, select **Accessibility** to expand the accessibility menu. If Accessibility is not in the list of tools, enter Accessibility into the **Search Tools…** field. When Accessibility shows up under the search field, right click on it and choose **Add Shortcut** from the menu and close the search field.
5. From the Accessibility tools select **Reading Order**. Then check **Show tables and figures**.

II.   Document Properties

To open the documents properties, click **File** > select **Properties…**

TEST
- The Description tab has the **Title** field filled out with a description of the document **and Tagged PDF** is set to **Yes**
- The Security tab has **Content Copying for Accessibility** set to **Allowed**
- The Initial View tab under **Window Options** > **Show** is set to **Document Title**
- The Advanced tab has the proper language selected

REMEDIATE

On the **Description** tab fill in the fields for **Title**, **Author**, and **Subject**. The title should be a brief description of what the document is. The Author can be the name of the agency with or without the directorate/office. Subject can be the same as the Title or a more detailed description of the contents of the document.
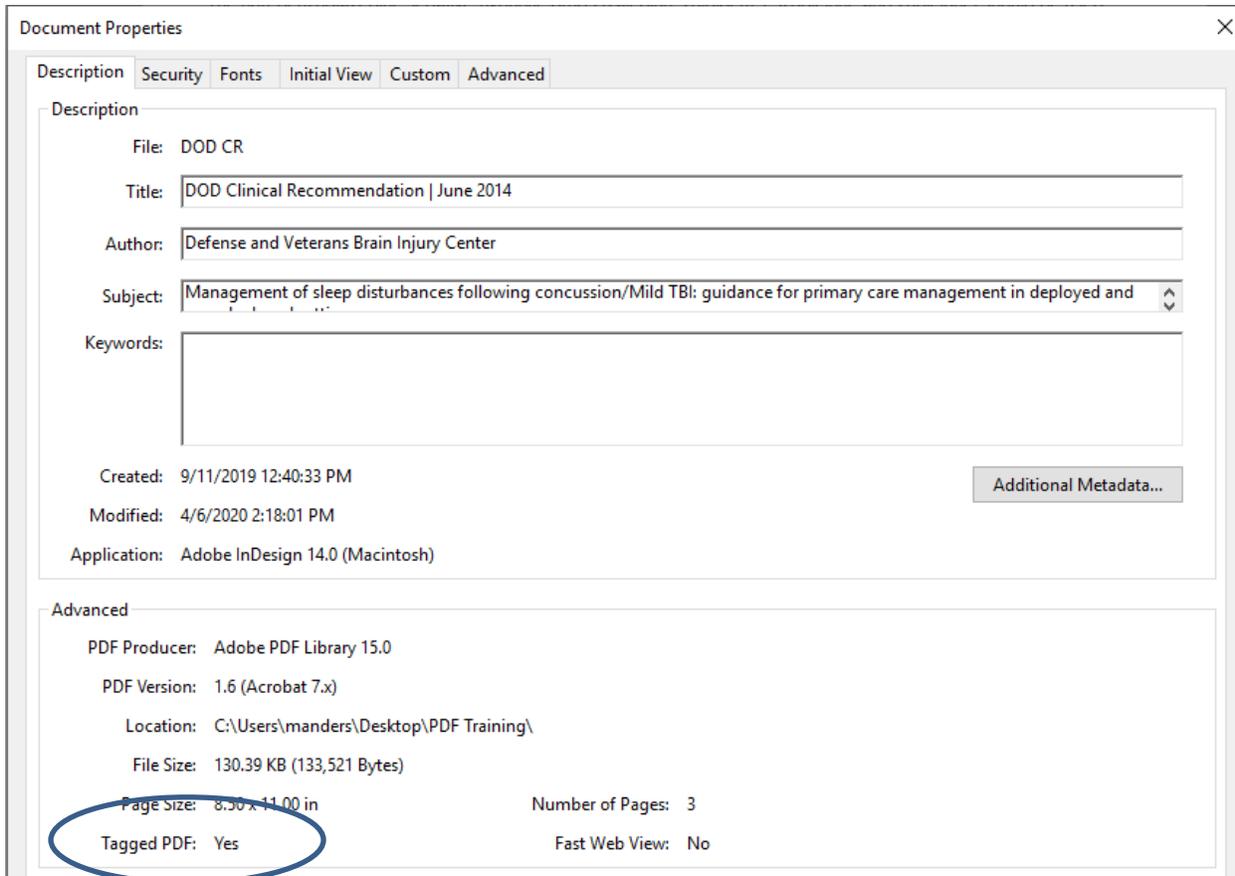
Check under the **Advanced** group that **Tagged PDF** is set to **Yes**.

On the **Security** tab make sure **No Security** is chosen. If you need to use security, use the **Change Settings…** button to set **Content Copying for Accessibility** to **Allowed**.
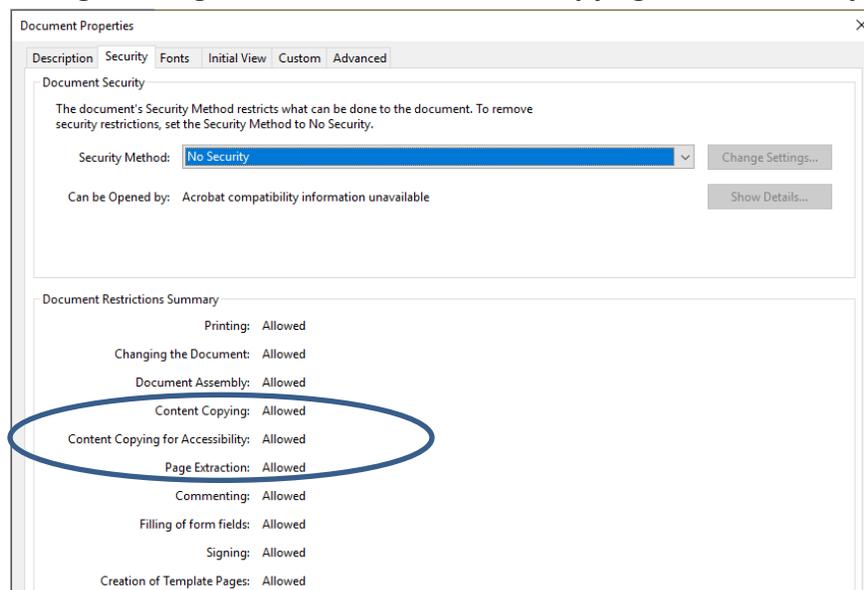
On the **Initial View** tab change the dropdown for the **Show** field: to **Document Title** instead of File Name.
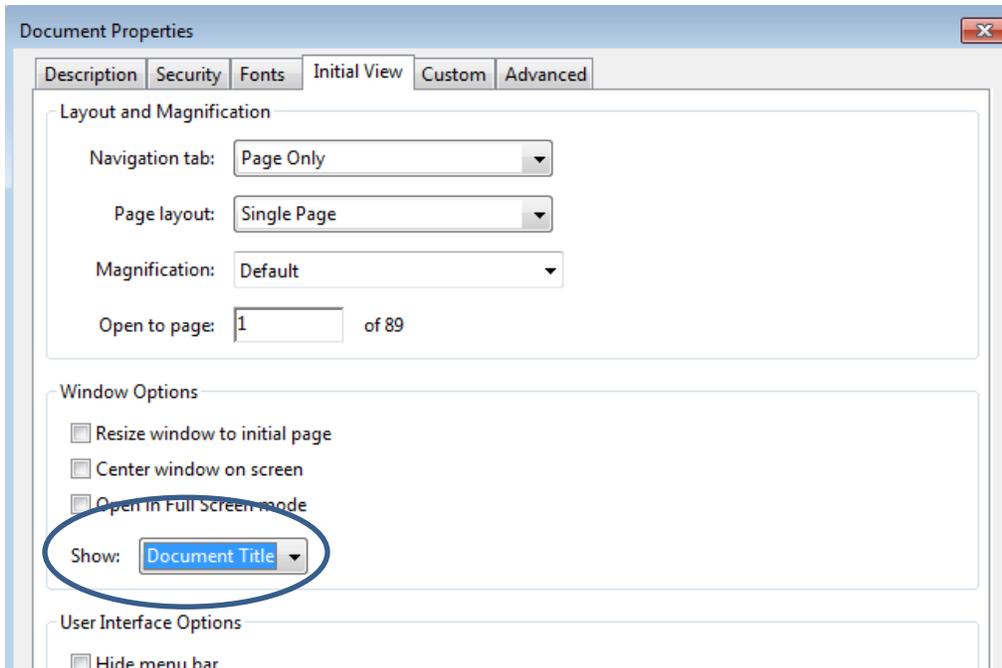
On the **Advanced** tab make sure the **Language** is set instead of blank.
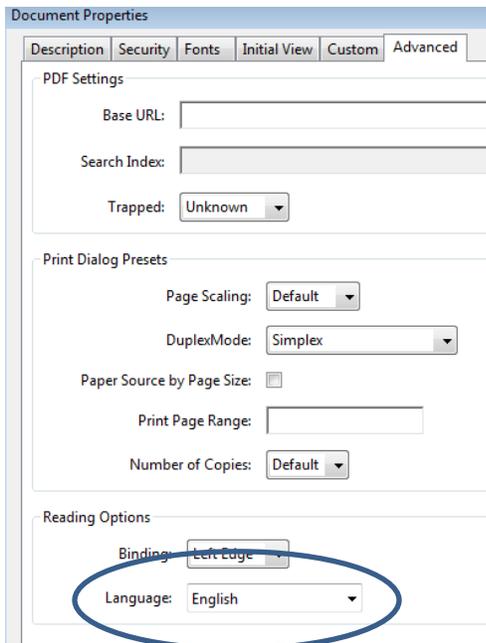
Click the OK button to close the Document Properties window.

NOTE:

If the PDF has file attachments or is a collection of documents combined into one PDF, open each individual document in the portfolio and test for compliance.
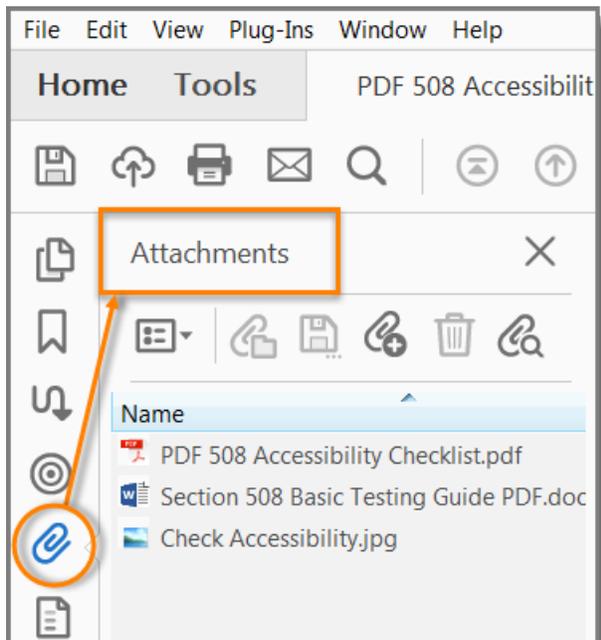
All or part of a PDF may be compiled from scanned pages but should be avoided unless necessary for reasons such as legal documents with signatures. Scanned pages are an image of the original. Screen readers cannot infer meaning from just a picture. Optical Character Recognition (OCR) may be used to recognize the images of text in the PDF.

Click **View** > **Tools** > **Enhance Scans** > **Open** > click the **Recognize Text** dropdown button in the newly opened toolbar and choose **In This File**. Choose the pages you want to scan and the language > click the **Recognize Text** button.

III.   Elements Tagged for Accessibility

Screen readers rely on tags to interpret the document structure (headings, paragraphs, lists, images, data tables, forms, and other objects). All meaningful text and objects must correspond to a tag, and the order of the tags must follow the visual/logical order of the document.

Selecting the plus symbol to the left of a tag will expand the tag and its child element, which is the content on the page that the tag is associated with.

TEST

- Open the Tags tree
- Expand the tags tree to see the individual tags for each element
- Select the first tag to highlight it and use the arrow keys to move down the list of tags, expanding container elements as necessary, and watch the highlighted content in the body of the document. Tags must follow the visible logical layout of the page.

REMEDIATE

Below is a list of the most common PDF tags. <u>All tags are case sensitive.</u> Span tags are new to Adobe and are caused from different text formatting. If you find Span tags in your document, you can leave them in place as screen reader software does not read them. When tagging a PDF, be sure to save often. Most actions involved in tagging a document cannot be undone.

Be sure to delete any empty tags (tags without a plus or minus sign next to them).

\<Artifact\> Hides the element from screen readers

\<Document\> The root element of a document's tag tree

\<Part\> A part element defines a large division of a document and may group smaller divisions together, such as Article, or Section elements.

\<Art\> Article – A self-contained body of text considered to be a single narrative. Often interchangeable with \<Part\>

\<Sect\> Typically a component of a Part or Article element, e.g., a section of the document

\<P\> Paragraph

\<H1\> Heading 1 – Recommended for the title and highest section level of a document

\<H2\> Heading 2

\<H3\> Heading 3

\<H4\> Heading 4

\<H5\> Heading 5

\<H6\> Heading 6

\<Figure\> Image/graphic

\<Link\> Hyperlink

\<L\> List

\<LI\> List item

\<Lbl\> List Label – bullet, number, or icon

\<LBody\> List body
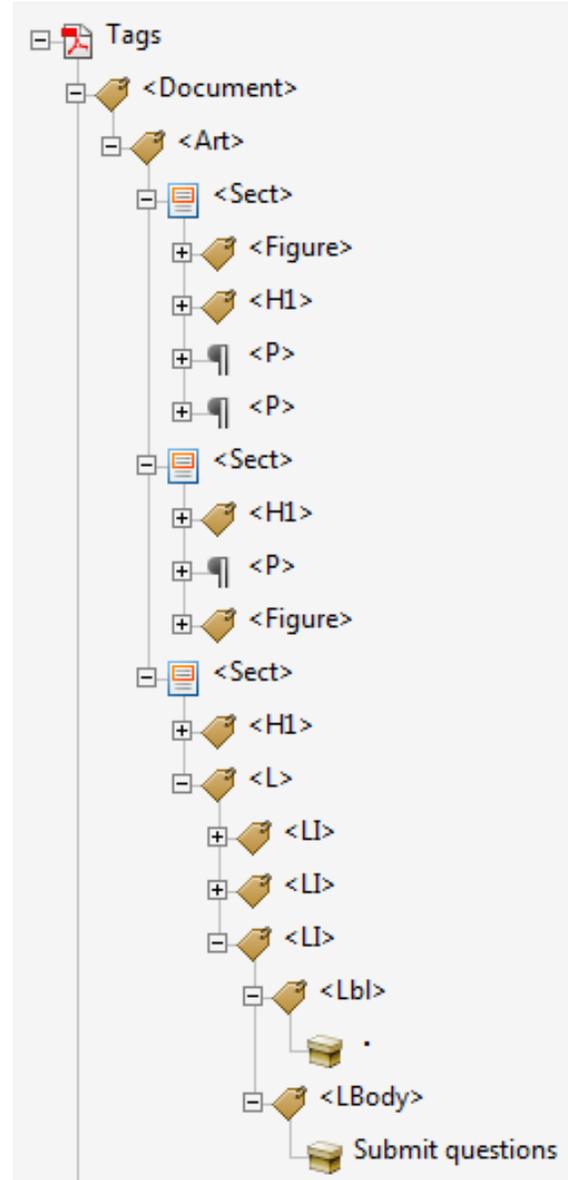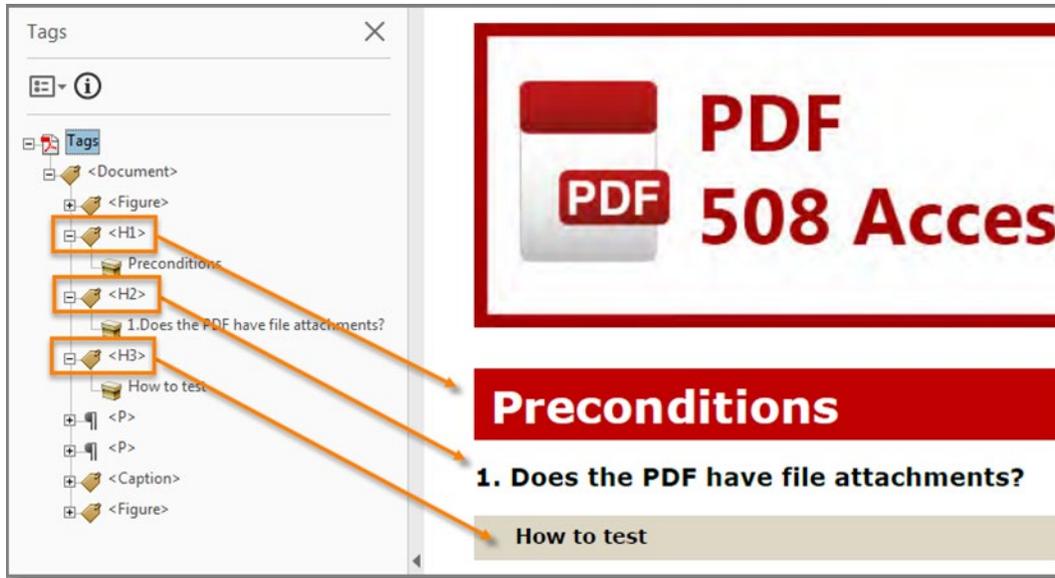
\<Table\> Table

\<TR\> Table Row

\<TH\> Table Header Cell

\<TD\> Table Data Cell

\<TOC\> Table of Contents

\<TOCI\> Table of Contents Item

\<Reference\> Link in a Table of Contents Item

\<Footnote\> linked to text in the body

\<Caption\> Nested inside a \<Figure\> tag

\<Form\> Form field

Designating Headings and Blocks of Text

Headings are used to break-up content and make finding information easier. Screen readers cannot infer meaning from just formatting, like bold or underline, so visual headings must correspond to a heading tag (i.e. H1, H2, H3) and heading tags must match the visual outline.

To change a tag, open the Tag tree and do one of the following to find a specific tag:

- User the arrow keys to move through the tag tree until you find the tag used for the element you wish to change
- Select the element by dragging your cursor over it to highlight it > select the menu icon in the Tags Pane and select **Find tag from selection**

There are 3 ways to change a tag:

1. Highlight the text in the tag between the brackets and type in the correct text
2. Open the **Touch Up Reading Order** window by selecting **Reading Order** under the **Accessibility tools** > click the number to the left of the grey box surrounding the desired text > and choose the correct button in the Touch Up Reading Order window
3. Right click the tag in the tag tree > select **Properties** > change the tag **Type** using the drop-down arrow

Structure of Lists

In Adobe Acrobat, each list structure must consist of a parent List <L> tag and subsequent list item <LI> tag for each item in the list. If there are a total of eight fruits listed, then there needs to be eight <LI> tags under the <L> tag. Each <LI> tag should (for best practice) contain a label <Lbl> tag that includes the number or bullet and a list item body tag <LBody> that contains the text of the item. Pay attention to lists that span across multiple pages. If a list continues on to the next page, it is important that the list items are all under one <L> tag.

Below is an example of proper list structure.

Example List:

- Oranges
- Grapes
- Apples

Example List Structure:

A sub-list (or nested list) must be structurally under, as a child, the list item to which it is related. It is placed after the text of the parent list item.

Example sub-list:

- Oranges
- Grapes
- Apples
    - Granny Smith
    - Orchard
    - Sour Apple
- Strawberries
- Cherries
- Cantaloupe

Example sub-list structure:

```
☐ <L>
    ☐ <LI>
    ☐ <LI>
    ☐ <LI>
        ☐ <Lbl>
        ☐ <LBody>
            📦 Apples
            ☐ <L>
                ☐ <LI>
                ☐ <LI>
                ☐ <LI>
    ☐ <LI>
    ☐ <LI>
    ☐ <LI>
```

Headers & Footers

Repeated content should be hidden from assistive technology. This information should be properly tagged in the first instance and then every other instance tagged as an Artifact, as described at the end of section IV.

Reading Order

The Tags Tree establishes the logical structure of the document, as well as the logical reading order for assistive technology, such as screen reader software. To rearrange the tags simply click a tag and hold down the mouse button as you drag it to the correct location.

IV.   Figure Elements and Alternative Text

Screen readers cannot infer meaning from images and other objects (pictures, images of text, charts, diagrams, shapes, icons with hyperlinks, etc.). Meaningful images must be accompanied by text that describes the purpose or function of the image. Images of text, or images that contain text (i.e. logos, or agency seals) should have the text in the image included in the

alternative text. Decorative images, or images that do not lend any new information or understanding of the content, should be tagged as Artifacts to hide the image from assistive technology. Always check the surrounding text of an image to see if the information given in the image is already given in surrounding text.

TEST

To verify that useful alternative text was used for images:

- Scroll through all pages to ensure all images are tagged as a **Figure**
- Select **Set Alternate Text** under the **Accessibility** tools
- Using the arrow buttons to cycle through and check that there is alternate text for each image and that the text conveys the purpose and/or function of the image or object
- For images of text, check that the descriptive text matches the text contained in the image verbatim

REMEDIATE

To add alternative text to an image, with the Touch Up Reading Order window open, right click on the image and choose **Edit Alternate Text** > add a description of the image. Alternatately from the **Accessibility** tools, choose **Set Alternate Text** and enter text for all images using the arrow keys to navigate.

Decorative content, such as ornamental images and redundant text, should be set to **Artifact** so screen readers can skip over it.

With the **Touch Up Reading Order** window open, select the image by clicking on the square in the upper left corner of the image and click the **Background** button. Alternately you can open the tag for the image and right click on the child element and choose **Change Tag to Artifact**… and click OK in the dialog box. You can do this with any element in the tag tree.

NOTE:

Images of tables, charts and graphs should be avoided. When they are used, they must include a "key take-away" as the alt text

V.   Data Tables

For accessibility purposes there are two types of tables. Layout and data. A layout table is used to display information visually. A data table has a header row or column and data cells that are associated with the header cells. A data table can be simple or complex. Simple tables are only required to have their header cells tagged with <TH> tags. Complex tables are additionally required to have the header cells defined with a scope and sometimes an ID.

TEST

With the Touch Up Reading Order window open, click on any number in any cell of a table and click the **Table Editor** button. Check to make sure the table has the proper cells marked as header cells using the <TH> tag.

REMEDIATE

Table Editor Options

By making some color and label selections in the Table Editor Options dialog, the current structure of the table can be more visually apparent.

Accessing and Using the Table Editor Options:

1. While the **Touch Up Reading Order** window is active, right click on any table in the document and choose **Table Editor** from the menu.
2. Confirm the table editor is active by confirming the default red border appears around each table cell.

TH Service	TH Component	TH Severity	TH Diagnosed
TH TH		TD Penetrating	TD 35
		TD Severe	TD 71
	Active	TD Moderate	TD 1,148
		TD Mild	TD 8,090
		TD Not Classifiable	TD 8
	TH	TD Penetrating	TD 9
		TD Severe	TD 12
Army	Guard	TD Moderate	TD 208
		TD Mild	TD 935
		TD Not Classifiable	TD 3
	TH	TD Penetrating	TD 5
		TD Severe	TD 10
	Reserve	TD Moderate	TD 120
		TD Mild	TD 562
		TD Not Classifiable	TD 2

> Table Cell Properties…
> Table Editor Options…

3. Right click in any cell and choose **Table Editor Options…**

4. Put a check in both boxes. The color options are a personal preference.

5. Click the OK button when finished.
6. Right click a cell to mark it as a header and select **Table Cell Properties…**
7. Choose **Header Cell** in the Type group. If the header row or column spans, add a scope and number or rows or columns that are spanned.

Tagging a Complex Table

A complex table has more than one header row or column and merges or split cells. The table we are using in our example (below) is a complex table listing worldwide TBI numbers for the Army. This table is a good example of complexity because the Army and its components are merged cells. Each diagnosed case is related to "Severity" and grouped by "Component" under the Army.

Complex tables must contain scope. Scope denotes which cells are row or column headers and identifies the number of rows or columns that are spanned. Each header (TH) will be assigned a unique ID and each data cell (TD) will have an array that includes all of the ID values of the applicable header cells.

Screen readers will read a table from left to right and top to bottom. If the data cells are not associated with the header cells the table may not make sense when read out loud.

Table Cell Properties

Setting the header cells and ID:

1. With the Table Editor open, right click the cell to mark it as a header and select **Table Cell Properties…**
2. Ensure the **Header Cell** radio button is selected.
3. Select **Row**, **Column**, or **Both** from the Scope combo box.
4. Adjust the values in the **Row Span** and **Column Span** edit boxes as necessary.
5. Enter a unique name in the **ID** field that identifies this header cell.

2016, as of August 10, 2017

2016, as of August 10, 2017

Note: It is best to name the ID something relative to what's in that cell so it is easy to remember which ID goes to which cell.

6. Click **OK** and repeat for each table header cell.

Setting the headers array for each data cell:

1. Right click on the first data cell and select **Table Cell Properties…**
2. Ensure the **Data Cell** radio button is selected in the Table Cell Properties dialog.

3. Navigate to and activate the Add button for the Associated Header Cell IDs list box.
4. From the list of available IDs, choose the one that would make the most sense to be read first.
5. Add the ID for each remaining header in the order that you want them to be read. (A screen reader will read each header cell's contents, not its ID.) This will build a list with the first header at the bottom and the last to be read at the top.
6. When done, click OK.

Ensure every form field has a descriptive tooltip.

To check or edit the Tooltip of an existing form field, select the **Prepare Form** button from the tools on the right. Then right click the field and select **Properties**. The Properties dialog box will appear. Ensure the Tooltip conveys all the information that a screen reader user would need to correctly complete the field.

Radio buttons

Radio buttons (a group of options where only one option can be selected) require additional information to ensure accessibility. The following information must be provided:

- The **Name** must be the same for all of the radio buttons within the group. This groups the options together, just like the name attribute for HTML radio buttons. It also allows a keyboard user to select an option within the group using the arrow keys.
- The **Tooltip** value should also be the same for all radio buttons within the group. This provides a shared label for each of the options, like the <fieldset> and <legend>elements in HTML. Because this information will be read for each option in the group, it should be succinct.
- Under the **Options** tab, the **Radio Button Choice** value must match the text that appears next to each radio button.

If these three fields contain the correct information, both the Tooltip and Radio Button Choice values will be read by a screen reader.

Checkbox

Unfortunately, checkboxes cannot be grouped together in the same way as radio buttons. This means that the description of the group of checkboxes and the individual checkbox should be presented in the Tooltip.

Button

To add text to a button, open the **Properties** dialog for the button, select the **Options** tab, and then enter the appropriate text in the **Label** option. If a button does not have a Tooltip, the text that appears on the button will be read by a screen reader, but if a Tooltip is provided it will override the button text.

Add Tags to Form Fields

- Open the **Tags pane** on the left side of the window, select the **Options** menu at the top of the Tags pane and select **Find**.
- In the Find Element dialog, select **Unmarked Annotations** from the dropdown menu, select the **Search Document** radio button, and then select the **Find** button.
- This should highlight the first untagged form field on the page. Select the **Tag Element** button and then the **Close** button. A Form tag will have to be added for every untagged item.

Check the reading order. Fields can be rearranged in the **Prepare Form** pane using drag and drop.

VII.   Structure of a Link

- Use the Tab key to tab through the document to find all links. This also checks for proper reading order.
- Verify the link text describes the destination, function, or purpose. Text such as 'click here' or 'read more' should not be used. Links must also be unique within the document.
- If an image is used as a link, the alt text can state the destination, function, or purpose
- Highlight the link text in the document > open the menu in the **Tags** pane and select **Find Tag From Selection**
- The **link text** and **Link-OBJR** tag must be under a **Link** tag

REMEDIATE

To add the Link-OBJR tag to a link:

1. Highlight the <Link> tag in the Tags pane. This will allow the tag to be placed in relation to its link text.
2. Right click the <Link> tag and select **Find…**
3. In the Find Element dialog, select **Unmarked Links** from the **Find** combo box.

4. Click the **Find** button.
5. When the link in question is highlighted in the main document by a blue rectangle, click the **Tag Element** button.
6. Click the Close button.
7. Confirm a Link-OBJR tag has been placed under the correct <Link> tag.

If no unmarked link is found the link needs to be manually added to the document.

Manually Adding/Editing a Link

1. In the **Tools** panel click on **Edit PDF**, and click the **Link dropdown** in the Edit tools and choose **Add/Edit Web or Document Link**.
2. Drag a box around the text to be used for the link.
3. In the Create Link text box select **Invisible Rectangle** for **Link type** and **None** for **Highlight Styles**. You only have to perform this step the first time you edit a link.
4. Click the **Next** button.
5. Enter the full URL or mailto: link for email addresses and click OK.
6. Repeat the steps in the previous section to find the untagged link. Be sure the <Link> tag is highlighted so the Link – OBJR tab is placed under the correct tag.

Applying Alternate Text to Links

This is only needed when a long URL is used instead of descriptive link text, e.g., https://dodcio.defense.gov/In-the-News/News-Display/Article/2311483/ambit-gambit-pays-off-advances-us-5g-efforts/. Alternate text can be applied so that the user will be able to access more useful information. Alternate text for the above link should be "Military Hospitals and Clinics".

1. In the Tags Tree click the plus sign next to the link tag to show the link text and Link-OBJR tag.
2. Click on the link text to highlight it.
3. Right click the link text and select **Properties** from the menu.
4. In the **Object Properties** dialog, place meaningful alternate text in the **Alternate Text** edit field.

Structure of a Table of Contents

The table of contents should be structured with the parent tag being a <TOC> and a <TOCI> for each table of contents item. Each <TOCI> should have a <Reference> tag under it. The <Reference> tag should have the link text and a Link-OBJR under it. In some cases, the link text and Link-OBJR are directly under a <Link> tag nested under the <Reference> tag. This will work equally as well.

VIII.   Sensory Characteristics

If an element uses color, size, shape, or location to convey information, the same information must be given in text format as well. An example of this is when a bar chart uses a legend with colors that match the bars. A simple way to remedy this is to add data labels to the chart, thus giving the same information in text format.

Color contrast must be 4.5:1 for 11-15pt font and 3:1 for 14pt bold or 18pt regular and higher. A Color Contrast Analyzer can be downloaded here https://www.tpgi.com/color-contrast-checker/ . This link is to the developer's site and is the app the DHS uses in training 508 testers in Federal agencies. JSP supported components can request the software from JSP using a FORM 7 (Software Request Form).

IX.   Accessibility Checker

The Accessibility Checker in Adobe is a good tool to check your work. It can be helpful in finding list items that are not nested properly or errors in tables. It should not be used as a tool to check the document for conformance issues in place of a manual test. The Accessibility Checker can check to see if all tagged figures have alternate text, but it cannot tell you if that text is meaningful. The Accessibility Checker cannot check the reading order of the document, as well as other aspects of accessibility.

To run the Accessibility Checker:

1. Under the Accessibility Tools choose **Full Check** from the options
2. Make sure all boxes have a check in them under **Checking Options**
3. Click the **Start Checking** button
4. The report will be displayed on the left side of the window. Open each category that has an issue by clicking the plus sign
5. Remediate each issue found, except for **Logical Reading Order** and **Color Contrast** under **Document**. These need to be manually checked.

X.   Conformant Checklist

Test Condition	Page #	Pass/Fail
The document properties: Title, Author & Subject are filled out; Tagged PDF set to Yes; Copying for Accessibility set to Allowed; initial view set to Document Title; Language is selected	2-5	
Attachments are accessible	5	
Tag tree: Tags are in proper reading order; Tag type reflects content type	6-8	
Proper heading tags are used and match the visual outline	8	
Lists are properly tagged	8-10	
Meaningful images have Alt Text	10-11	
Data Tables: Header cells are designated; Scope, Span, and ID are used in complex tables	13-14	
Forms: Fields are in the correct tab order; Tooltips are used on all fields	15	
Links: Link text describes the destination, function or purpose; there are no broken links; there is a Link-OBJR under each <Link> tag	16-17	
Color, size, shape, or location is not the only means to convey information	18	
Color contrast between text and background is high	18	
Passes Accessibility Checker with the exception of Logical Reading Order and Color Contrast. These can only be checked manually.	18	

Further information and training videos on testing and remediating PDFs can be found at
https://www.section508.gov/create/pdfs/training-videos