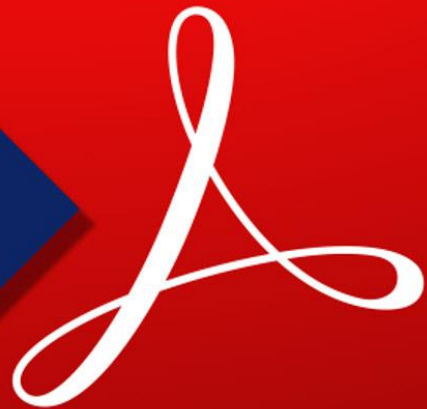# PDF Form Design

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TWC Accessibility

May 11, 2018

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Introduction

"PDF" stands for "Portable Document Format". It is an open standard developed by Adobe, and is designed for print. We prefer PDF format to other formats, such as Word or Excel, when creating "electronic paper forms" for a few reasons. PDF format:

- **Allows for single file distribution** – Unlike a Word document, a PDF will look the same everywhere. Unlike a Web page, a PDF can be attached to an email and distributed independently.

- **Provides a free, widely-distributed reader** – Adobe Reader is free and most people already have it available on their computers. Other readers also exist, including PDF readers built into browsers.[1]

- **Gives document access control / print control** – It is possible to discourage users from editing the content of the document in a PDF in ways that are not possible in Word documents.

- **Allows for electronic navigation of all text and headings** – Word forms must be locked down which limits interaction with text. Excel does not provide true headings which limits options for creating document structure.

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[1] Adobe Reader is the only PDF reading application accessible to screen readers and PDFs must be opened in the Adobe Reader desktop application – not the browser plugin – for a screen reader to work.

We accept that a preference for PDF forms over other types of electronic forms may be controversial. We recognize that PDF's:

- **Have a bad reputation among screen reader users.** While PDFs can be made very accessible, this often does not happen. Also, many users may not know to open the PDF using Adobe Reader[2], rather than the browser plugin.

- **Are not always appropriate for web presentation.** In general, a Web page is the most accessible option.

When creating a PDF form, accessibility concepts should be considered throughout the document creation process to achieve a fully accessible final document. This booklet is not a comprehensive resource on making PDF documents accessible. For more information about making accessible PDF documents, refer to Create and verify PDF accessibility (Acrobat Pro)[3] or Acrobat Pro DC Accessible Forms and Interactive Documents[4].

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[2] The Set PDFs to Open in Acrobat Pro or Reader section in this document gives you the steps to set the defaults on your computer.

[3] https://helpx.adobe.com/acrobat/using/create-verify-pdf-accessibility.html#make_PDFs_accessible

[4] https://www.adobe.com/accessibility/products/acrobat/creating-accessible-forms.html

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Planning Your Form: Formatting the Source Document

Certain steps must be taken in the source document prior to conversion to PDF because of Acrobat's restricted word processor options and limited layout functions. We use Microsoft Word to create most of our form source documents. Though there are other programs you can use to design forms, such as InDesign or LiveCycle, Microsoft Word is readily available and familiar to almost everyone.

The items in this section are best finalized now to save you time later. You don't want to discover any errors after you've got the whole document tagged. When that happens, you have to essentially start over and all that time is lost.

Content

Ensure the content of the source document:

- Asks only for the information you absolutely need. In the words of UI/UX Designer, Ken Lee-Sanekata, "Take away as many form fields as possible, until you can't, and then you try some more." Really consider how the form is used and what its purpose is before committing to 50 form fields when 10 would do the job.

- Is written in plain language. This applies to all text in the form: questions, labels, and instructions. Exceptions to this would be forms that have a niche audience, though we caution you to not use that as an excuse to write clearly. Even forms with very specific user groups have new people join those groups. The clearer the form's language, the fewer questions you will get on the back end.

- Has good flow. Information and form fields should appear in a logical order that does not jump around. For example, instructions typically appear before a user is supposed to act; they are of little help after someone has already filled out a field. Address options generally appear in order of street, city, state, zip. Putting information out of order increases cognitive load. If there is no logical order to a selection of items, use alphabetical order.

- Has clear instructions. When filling out a form, users should be clearly told what is expected. This includes small instructions like "select one," "select all that apply," "fields with an asterisk are required," or "(optional)." This also means labeling form fields with required formats, such as "Phone number: (xxx) xxx-xxxx," if you choose to use them.

- Has document information in the header or footer on each page, such as "Form xyz, page 2." The format of this information is at your discretion, though if a form has two names, then both names should appear at the top of the first page, then you can use the abbreviated name in the header or footer.

- Uses form fields for their intended function:

  o **Text fields** are used where the field entry can vary widely. Examples include names, addresses and descriptions or explanations. Ensure the field is large enough to contain the desired entry.

  o **Check boxes** are used where there are a set number of selections and more than one may be selected at a time. If "select all that apply" is applicable to that section, check boxes should be used. The default size of checkboxes is somewhat large, so you may want to resize it.

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- o **Radio buttons** are used when there is a set number of selections, but only one may be selected. If "select only one" or yes/no is applicable to that section, radio buttons should be used. If there are more than a handful of selections, use a dropdown list to save space on the form. The default size of radio buttons is somewhat large, so you may want to resize it.

- o **Dropdown lists** are used when there are a set number of selections, but only one may be selected. Ensure the field is wide enough to show the text of the widest selection.

Font Selection and Size

Ensure the font selections and sizes in the source document are readable. We recommend using 12-point Verdana for most content, though many other fonts are considered accessible. Headings should use bigger, bolder choices to make them stand out.

Layout

Ensure the source document's layout:

- Is intuitive to use. Typically, that means that information reads from left to right, top to bottom.

- Groups form fields according to function or type.

- Has consistently placed form field labels. When possible, select a placement and stick to it, whether it be all form labels above the fields or generally to the left. Exceptions are check box and radio button options which typically fall to the right of the field.

- Uses headings to provide users with a meaningful sequence of information and make the document easier to navigate. Headings are

set with Heading styles 1 through 9 in Word, though Acrobat only goes up to heading level 6.

- Has adequate text spacing:

  o We recommend at least 1.15 line spacing within paragraphs.

  o We recommend a minimum of 16-point After paragraph spacing for a 12-point font.

  o We recommend a minimum of .02 top, bottom, left, and right spacing around text inside of tables.

- Has adequate space to contain all the answers expected for each form field and prevent scrolling. This is especially important for forms that will be printed. Acrobat does not have expanding form fields like Word does. To save yourself time, test this in the source document prior to converting to PDF. We recommend a minimum of:

  o 35 characters each for first and last name or the equivalent (71) for a full name field.

  o 40 characters for address lines and city names.

  o 2 characters for a state abbreviation and skipping the state list dropdown.

  o 9 characters for a zip code.

  o 40 characters for an email address.

The flip side to this is not giving too much space for the size of the expected input. You don't want a 40-character form field to hold something that's a set number of characters like a date.

Using Tables for Layout

The best way to create a paper form that has a consistent and logical layout and that flows predictably is to use a layout table. The table will be removed after conversion to PDF so typical table concerns are not an issue.

Following are tips for formatting a layout table in Word:

- Adjust table width in **Table Properties** or on the ruler in the document view.

- Use borders to distinguish table cells. Select the table, go to the Table Tools area of the Ribbon, choose the Design tab and click on Borders.

- If your entire form is a table, use the top row of the table for the logo, form title, and other information, such as the date. If you are using paragraphs for the document title and instructions, use the top row for the first table section heading.

- Use section headings to change subject content, group like form fields, and to help a low-vision user quickly find a particular section.

- Use merged cells to keep like information together.

- Use split cells to separate.

- Use blank spaces to get the exact layout you want. It's visually pleasing when similar items line up both vertically and horizontally, if possible.

Commission Meeting Agenda Item (LS-1)

Fields with an asterisk are required. Please contact OGC if you have any questions about this form.	
Meeting date*:	
Standing item*: ◯ Yes, through date: ◯ No	
Note that, for any agenda item that is not a standing item, the division is responsible for submitting a new LS-1 for each Commission meeting.	
Division Director*:	
Presenter*:	
Back-up presenter:	
Type of action*: ◯ Action ◯ Information only	

Figure 1 – Example Form Using a Table for Layout

Color

Though it is important to avoid the use of color alone to convey information, color is a great way to help sighted users navigate a form. It can be used to make headings and instructions stand out. Using color wisely can also give your form a more finished look.

Figure 2 – Form Before and After Showing Use of Color

When selecting colors to use in your forms, verify sufficient color contrast ratios, so it is easy to discern text from background. We recommend downloading the Color Contrast Analyser tool and using it to verify adequate contrast ratio of 4.5:1 (Figure 3, item 1).
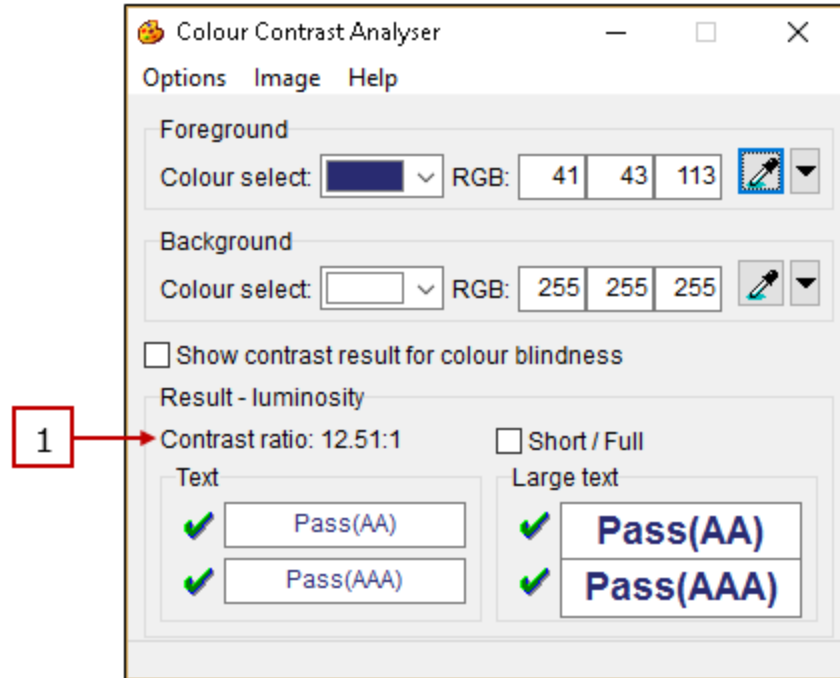
Figure 3 – Colour Contrast Analyser Results

Convert from Word to PDF

It's worth noting that even if your source document is fully accessible, it won't always convert as intended, so some items may need tweaking anyway. Follow the steps below to convert your source document to PDF.

1. Go to **File** > **Save As**.

2. In the middle top of the window, you'll see a place to put the file name. Under that is a dropdown (Figure 4, item 1) to select the file format. Select **PDF** (Figure 4, item 2) from the dropdown.
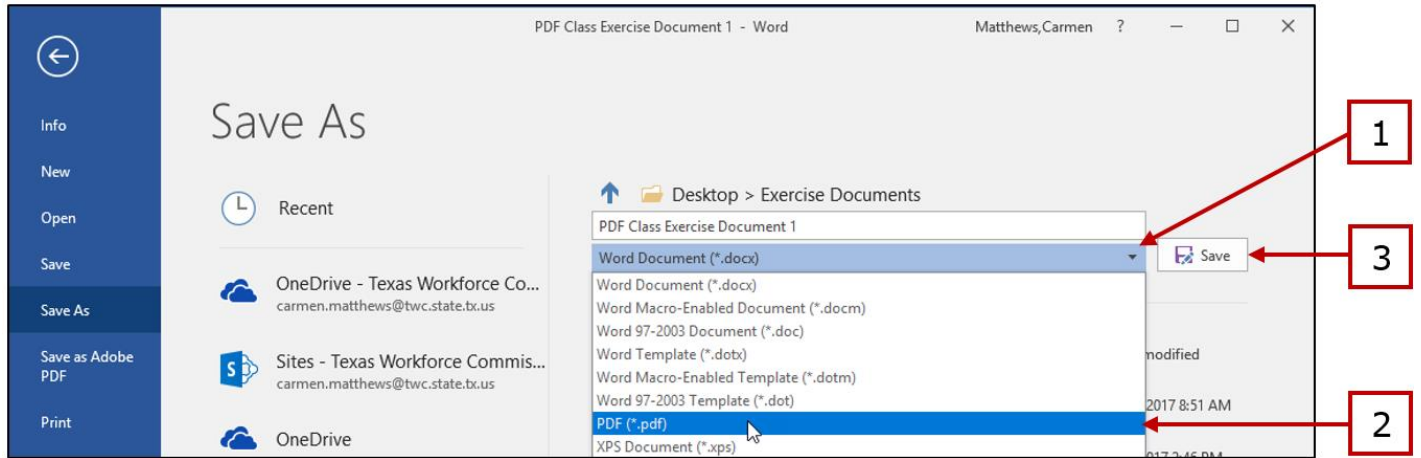
Figure 4 – Save As Window

3. Select the **Save** button (Figure 4, item 3).

4. A tagged PDF version of your document will open in a new window. If it does not automatically open, navigate to the location where you saved the document and open it.

Formatting the PDF

This section applies to all PDF forms, whether they were converted from accessible source documents or were already PDFs. The following tasks will be performed (or at least verified) in the PDF.

If you are unfamiliar with using Acrobat Pro, the Acrobat User Guide workspace basics page[5] will help.

PDF forms start off a bit differently than the average PDF document. Prior to adding form fields, it is best to delete the tags from the document. Then, after your form fields are added, you can add all the tags at once and everything will be in the correct order. If you edit the original tags, then tag the form fields, all the of your work will be overwritten.

To begin creation of a PDF form:

1. delete the existing tags,

2. add the form fields,

3. set and verify form field properties, then

4. add tags to the document.

The steps to do all the above tasks can be found in the sections below.

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[5] https://helpx.adobe.com/acrobat/using/workspace-basics.html

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Delete the Existing Tags

1. In the Tags pane, right click on **Tags** (Figure 5, item 1) and select **Delete Tag** (Figure 5, item 2) from the resulting dropdown.
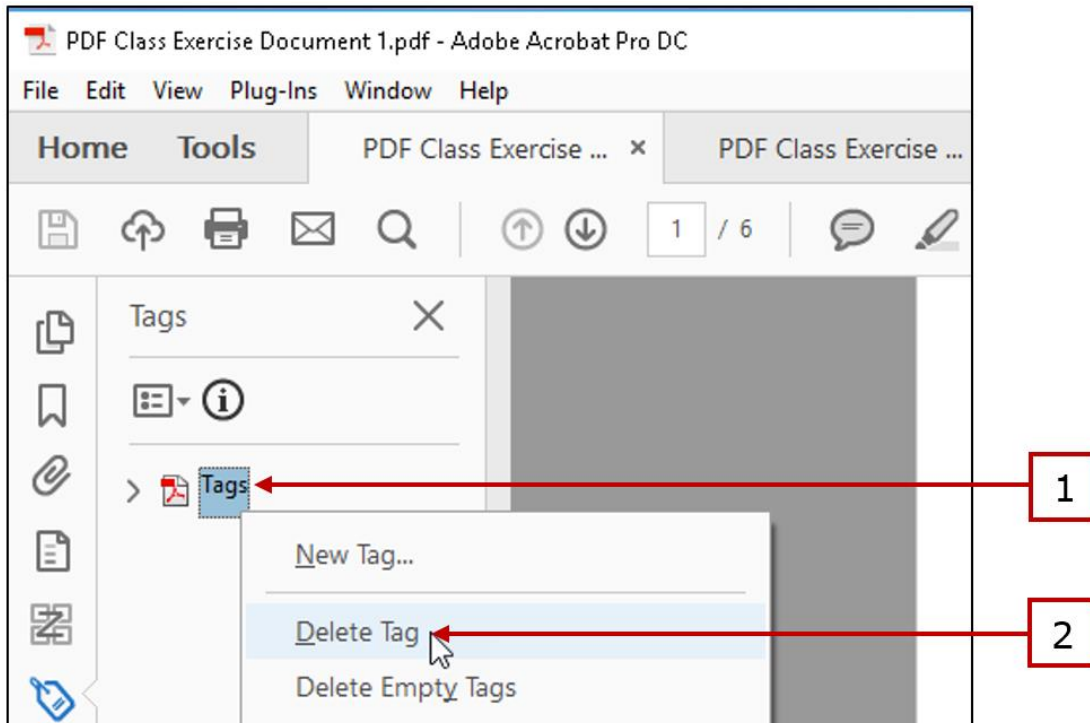
Figure 5 – Deleting Empty Tags from the Tags Pane

2. The pane will now say **No Tags Available** (Figure 6).
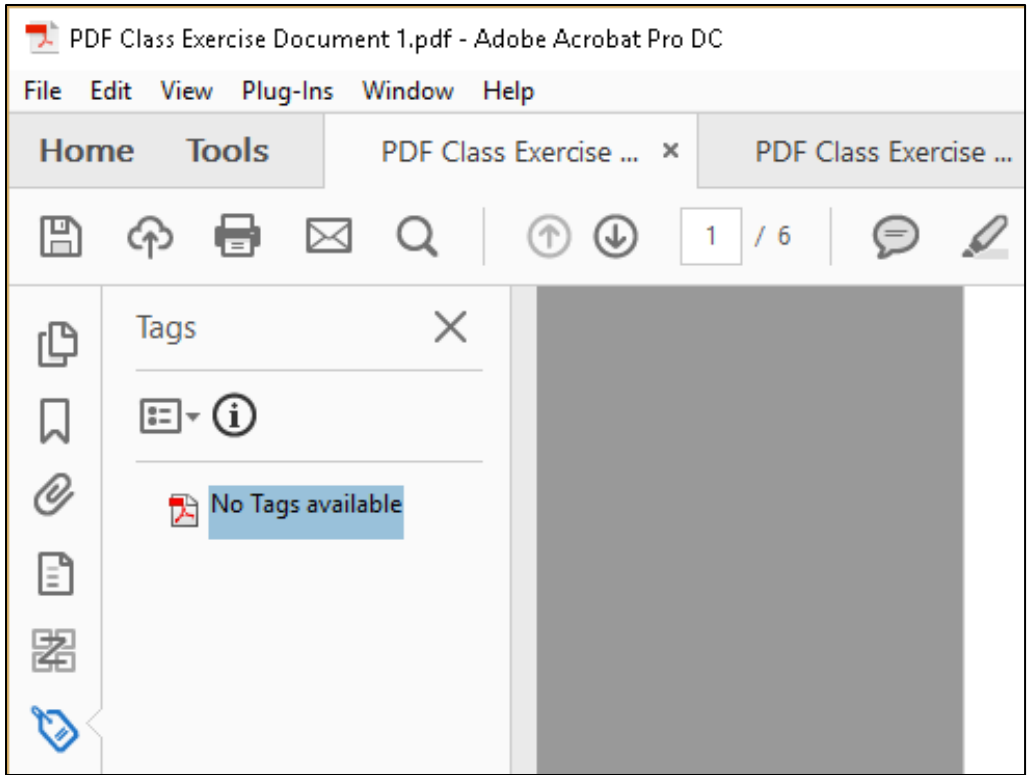
Figure 6 – No Tags Available in Tags Pane

Add the Form Fields

1. In the right pane, select **Prepare Form**. The Prepare Form screen will appear. **Note:** If Prepare Form is not in the right pane, go to **Tools**, then select **Add** under the Prepare Form icon.

2. Select the document you want to add form fields to then select **Start**.

3. Acrobat will add form fields based on the layout of the document. Form fields will not always be where you want them. There may be extra fields or missing fields.

   - To delete an extra field, right click on the field and select **Delete** from the resulting menu. We recommend deleting extra fields first, so that you don't accidentally waste time formatting a field you don't need.

   - To add a missing form field, select the type of field you want from the Prepare Form ribbon (Figure 7) at the top of the screen then click on the place in the document where you want the field to appear. Common field selections are:

     o Text field (Figure 7, item 1)

     o Check box (Figure 7, item 2)

     o Radio button (Figure 7, item 3). Radio buttons work as a group. All radio buttons with the same name are one group.

     o Dropdown list (Figure 7, item 4)
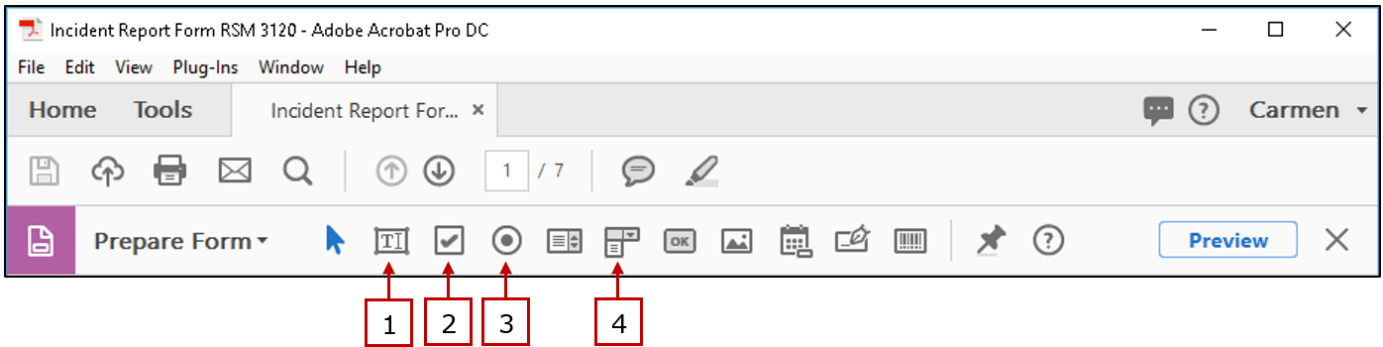
Figure 7 – Prepare Form Ribbon Showing Form Field Icons

> **Time saving tip: Add all of your text fields first, then use the tips in the next section to set all the properties for these fields. After all like properties are set, go back and add in check boxes, radio buttons, or dropdown lists and format as needed.**

4.   Check the order of the form fields in the Fields pane of the Prepare Forms tool. Drag any out of order fields to the correct place.

Set/Verify Form Field Properties

At a minimum, every form field must have a tooltip set for it in the properties. Acrobat will automatically set the tooltip based on the label next to the field, but we still recommend verifying the correctness of the properties of each one.

To set the properties:

1.   Double click on the desired form field to open the **Properties** window (Figure 8). The name of the window will change depending on the type of form field. The example below shows properties for a text field, so the window is named Text Field Properties.
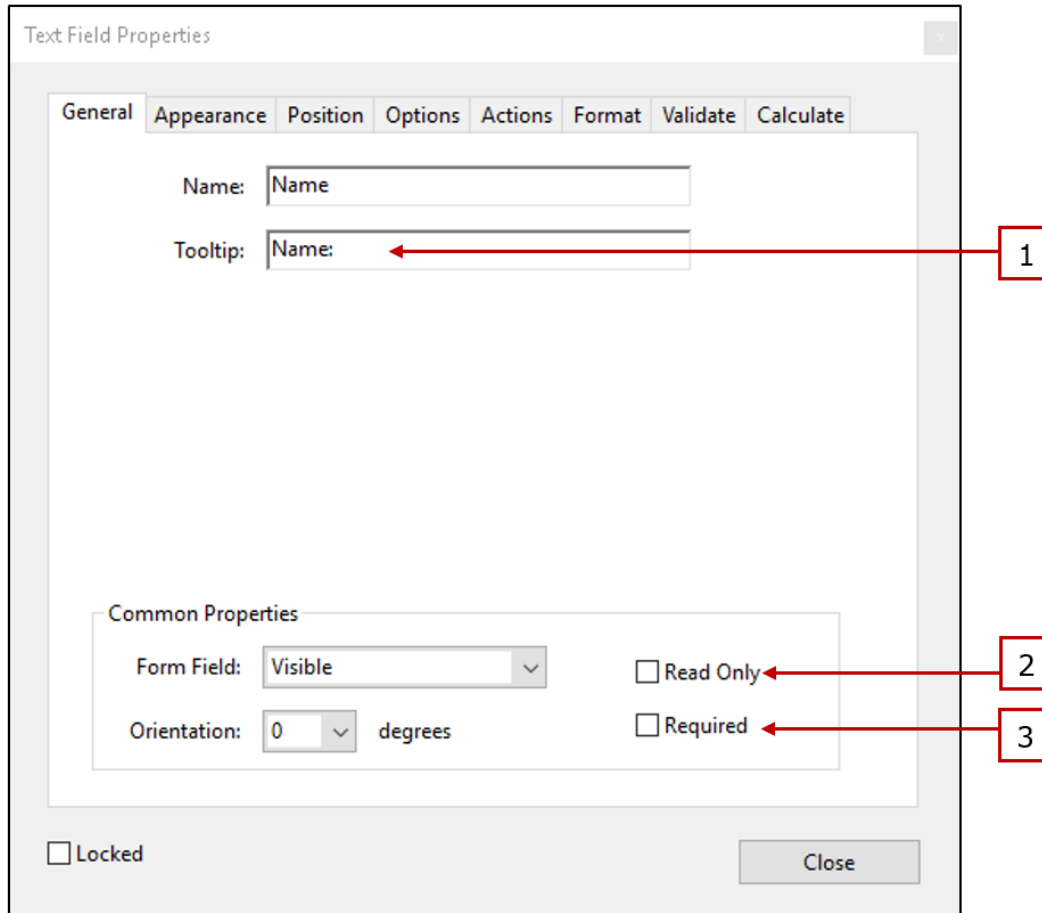
Figure 8 – Text Field Properties Window, General Tab

2. On the **General** tab, ensure the **Tooltip** (Figure 8, item 1) field correctly reflects the label on the form. Optionally:

   a. Set the form field to **Read Only** (Figure 8, item 2). We often do this for the signature fields of forms that are signed physically then say something like "Signature, print and sign form" in the tooltip.

   b. Set the form field as **Required** (Figure 8, item 3). Note that this setting will make the boxes around these fields red while you are in Prepare Form mode.

3. On the **Appearance** tab (Figure 9), set the font that responses will appear in. We do not recommend using the Auto font size, as this allows the text to shrink to a point where it is unreadable. **We recommend 12-point Verdana** (Figure 9, items 1 and 2).
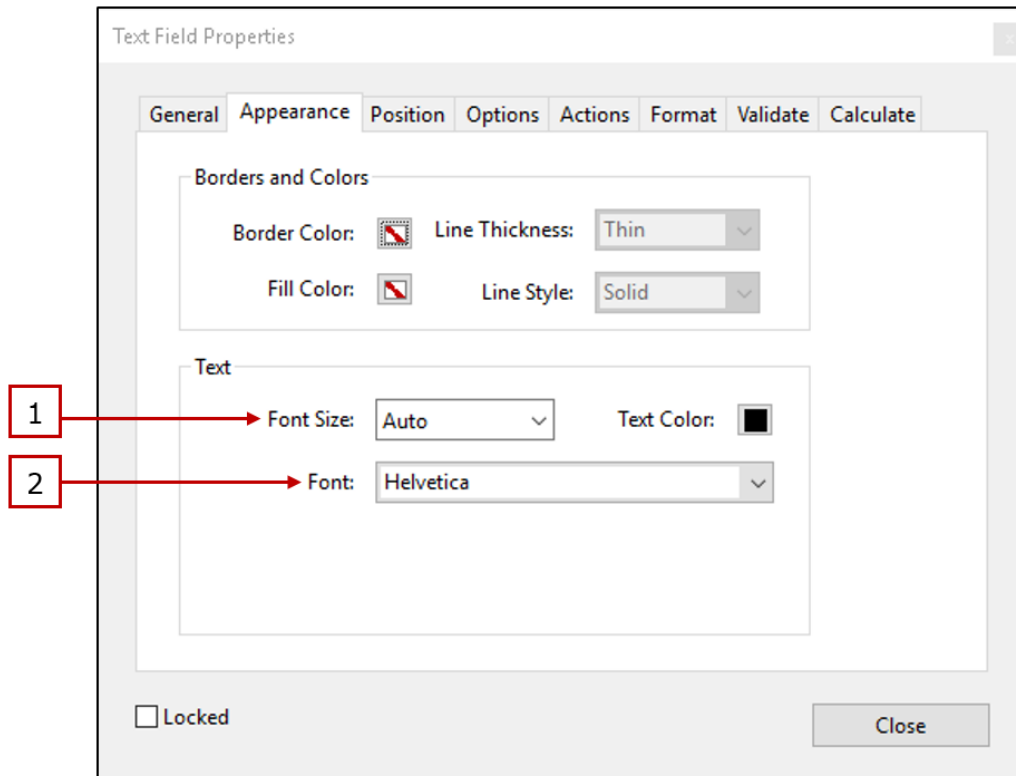
Figure 9 – Text Field Properties Window, Appearance Tab

4. On the **Options** tab, set how you want the field to handle text.
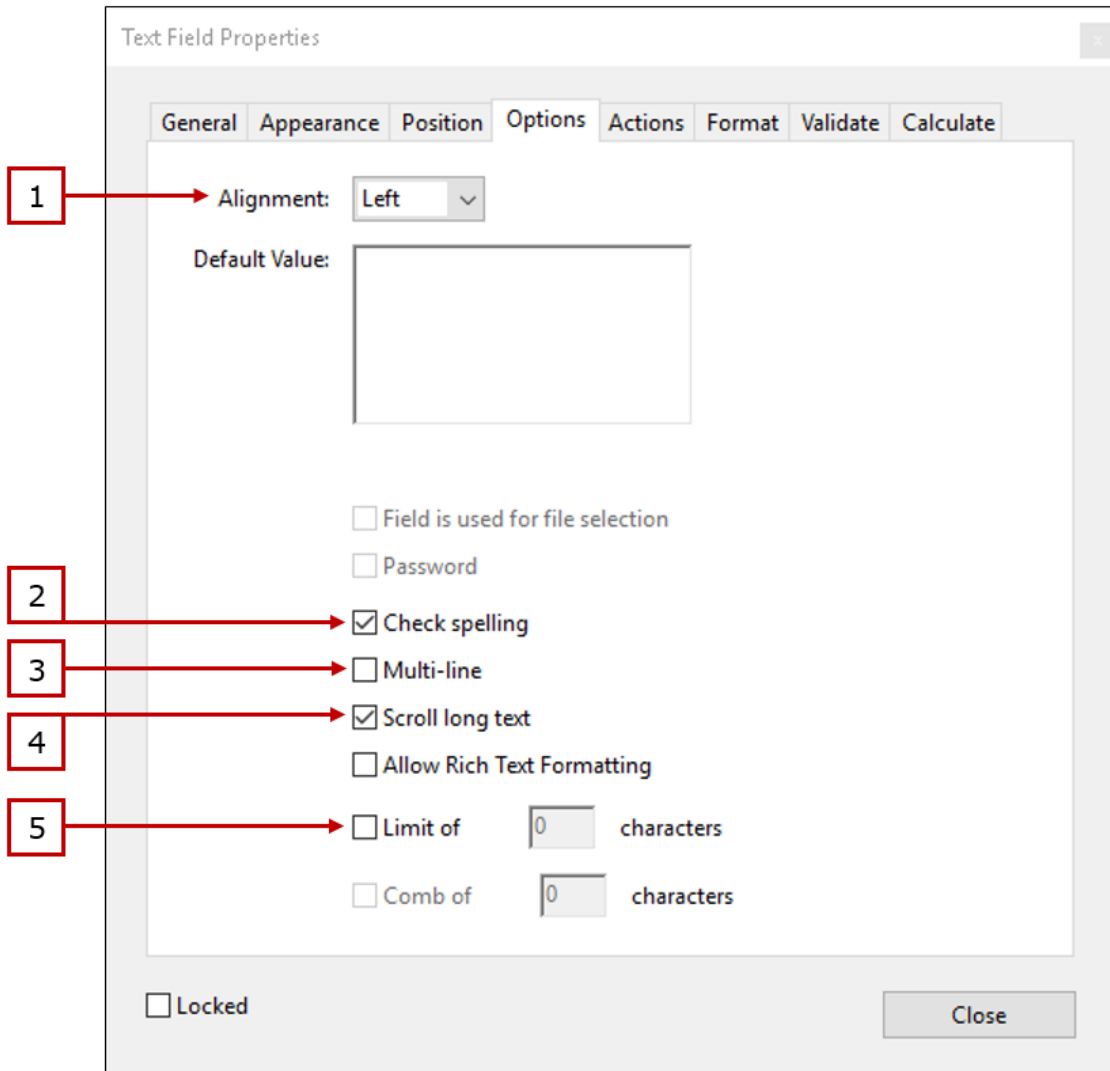
Figure 10 – Text Field Properties Window, Options Tab

a. Leave the alignment (Figure 10, item 1) **Left** if the form field entry will be text. Set the alignment **Right** if the form field entry will be numerical.

b. Leave **Check spelling** (Figure 10, item 2) checked so that those filling out the form will know when they have made a spelling error.

c. Select **Multi-line** (Figure 10, item 3) if the field is supposed to receive a multiple line answer. Be sure the input field has enough space to allow multiple lines of input. Do not select this if the field allows room for one line of an answer.

d. Select **Scroll long text** (Figure 10, item 4) if you wish to allow the user to enter more text than will fit in the input field and the form will be used electronically. If the form is to be printed, any words that scrolled will not show on the printed version. We recommend turning this selection off, unless the form will never be printed.

e. Select **Limit of [x] characters** (Figure 10, item 5) if the field input is limited. Optionally, provide the character limit in the visual form field label. If Font Size = Auto is selected on the Appearance tab, choose a character limit that will prevent the font from shrinking to an unreadable size.

> **Time saving tip: Once the Properties window is open, you can leave it up and select other form fields to view their properties. This saves you many clicks along the way.**
>
> **Another time saving tip: For form fields that have similar properties, such as those on the Appearance and Options tabs, you can select more than one form field and set the properties for all of them at once.**

We rarely use options on the Format tab on fields that hold items such as dates or phone numbers. If you choose to limit the format of form entries, you should let users know by providing that information both visually (in the source document prior to converting) and in the tooltip of the field. An example would be a tooltip that says "Date signed: 2 digit day/2 digit month/2 digit year" or "Date signed: dd/mm/yy" with a label such as "Date signed: (dd/mm/yy)."

Add Tags to the Document

After all form fields have been created, you will add the accessibility tags back to the document. Be sure you are happy with all form field configurations before proceeding, since going back to correct them after the tags are created can sometimes have unpredictable results.

In the Tags pane, right click on **No Tags available** (Figure 11, item 1) and select **Add Tags to Document** (Figure 11, item 2) from the resulting menu. Tags will appear in the Tags pane.
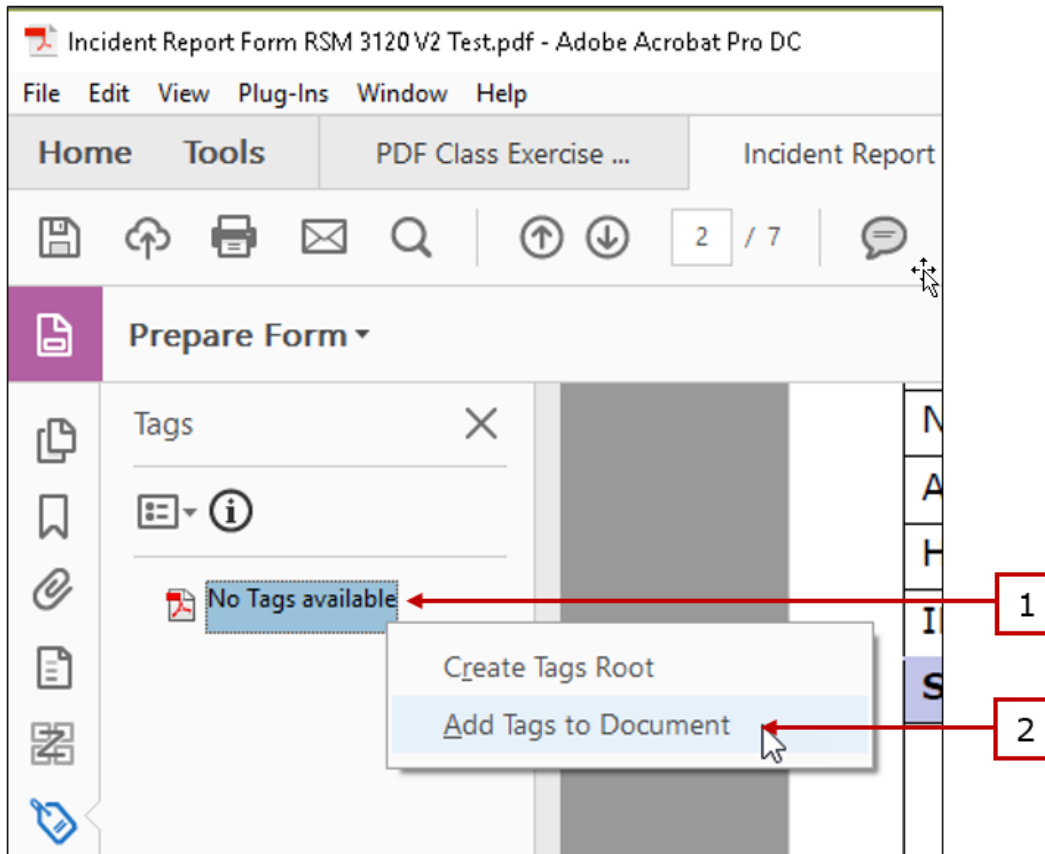
Figure 11 – Add Tags to Document

Tags not only set the order the document is navigated in, they determine how content is read by screen readers. It is imperative that the tags in your document correctly reflect the function a given item (text, image, table, etc.) has and that the tags are in the correct order.

Run the Accessibility Full Check

The Accessibility Full Check is a tool you can use to ensure you didn't miss any key accessibility aspects. It will not catch everything in the document, which is why we encourage you to learn and apply all the accessibility concepts prior to running the check. However, it is a nice addition to the accessibility process and we encourage you to run it on all your documents. To run the Accessibility Full Check:

1. Select **Accessibility** in the right pane. The selections in the right pane will change. Note: If Accessibility does not appear in the right pane, go to **Tools** then select **Open** under the Accessibility icon.

2. Select **Full Check**. The Accessibility Checker Options window appears.

3. You don't need to change anything in the window. Select **Start Checking**. Depending on how large your document is, the check may take a minute.

4. Results will appear in the left pane (Figure 12). Anything that is in bold is an issue. The number beside the item is the number of issues found. If you have done everything in this manual, you should only have two issues in bold.
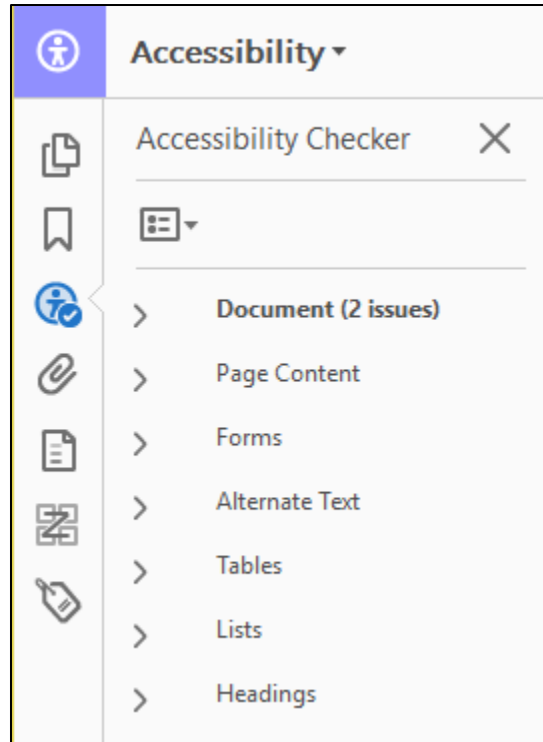
Figure 12 – Accessibility Checker Results in the Left Pane

> **Two issues will always be bold in the checker results: Document > Logical reading order and Document > Color contrast. Both of these must be checked manually. Once you have checked them, right click on each and select Pass.**

5. Use the expander beside each bold issue to expand view each item. You may need to expand more than once (such as **Alternate Text** > **Figures alternate text – failed** to see the list of figures without alt text).
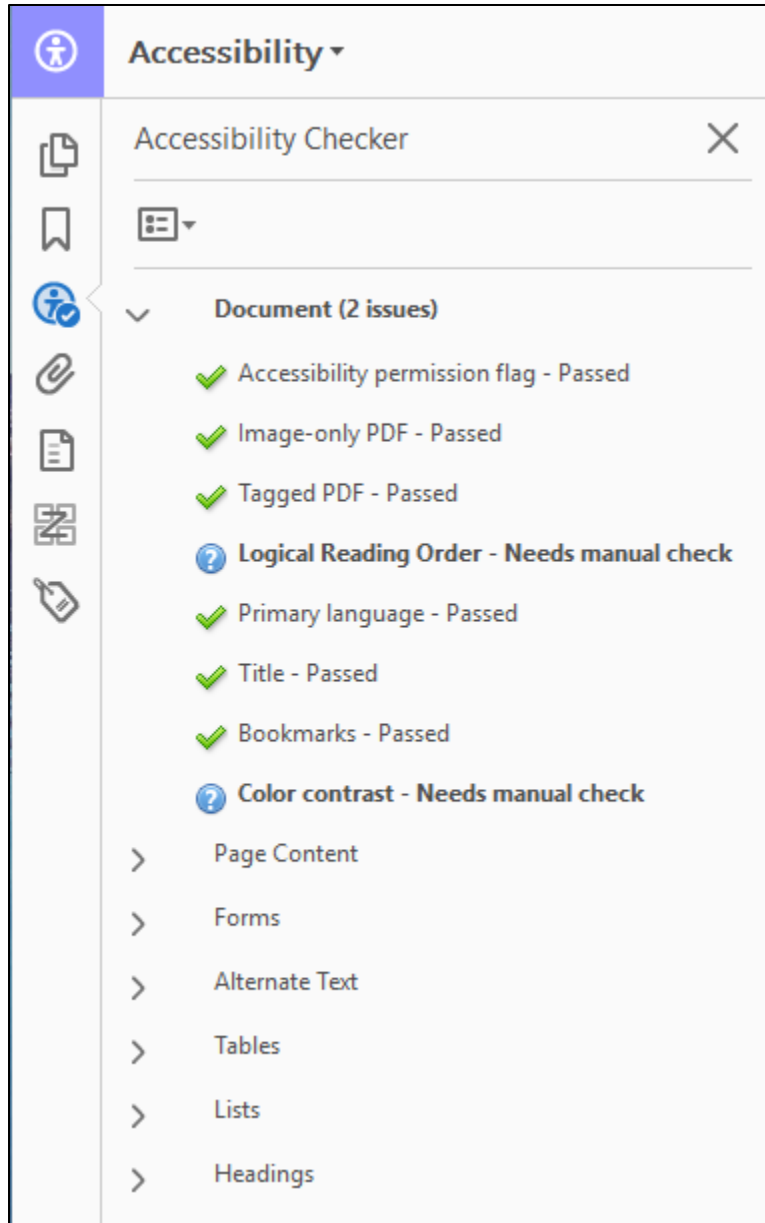
Figure 13– Accessibility Checker Results Expanded

6. Once you get down to the root list of issues (the bolded items do not have expanders), you can right click on each for guidance on how to fix it. For simple things like alt text and document title (often referred to in class as document properties), select **Fix** and a window will open for you to edit those items. For more complex issues such as table headers, you can select **Show in Tags panel** and follow the instructions in previous sections here to fix the issue.

7. When you feel each of your issues are fixed, right click on each and select **Check Again**. You should complete the document with no issues showing in the check.

Perform Manual Accessibility Tests

Even when you follow all of the accessibility rules, things can still be wrong in the document. It's a good idea to do a quick manual test of each form prior to calling it final.

Keyboard

Keyboard accessibility is one of the most important aspects of accessibility. Many users with motor impairment rely on keyboards to navigate documents. A few common keys, such as Tab, arrows, Enter, and Space Bar, are used to perform keyboard testing.

Generally, you can just tab through the document to navigate through all the links and form fields.

- Tab to links and press **Enter** to open them.

- Tab to form fields, then:

  o Type directly into text fields.

  o Use the arrow keys to navigate through dropdown selections or **Alt** + **Down Arrow** to expand dropdown lists.

  o Use the arrow keys to navigate between radio button choices.

Refer to [Keys for navigating a PDF](#)[6] if you'd like more information about keyboard use.

Screen Reader

Testing PDFs with JAWS is not generally required. As long as you've taken all the steps outlined in this guide to make the PDF accessible, you can usually feel comfortable that the document is accessible. However, if you have access to JAWS, it's a good idea to go ahead and give the PDF a final check with JAWS and make sure everything behaves as expected. JAWS will automatically read an entire document if you open JAWS then open the document. This is the easiest way to test. If the document is not read automatically, press **Insert** + **Down Arrow**.

You will also want to confirm the labels for all form fields are announced properly by JAWS when you use the Tab key to move from field to field.

Refer to [Accessing PDF Documents with Assistive Technology](#)[7] for more tips and keystrokes.

Change Reading Options for Large Files

When reading large PDF files, JAWS will sometimes act in unexpected ways. Depending on your PDF settings, JAWS might only read a single page at a time. When this happens, you will not be able to use some JAWS features effectively. For example, you cannot use JAWS heading navigation to move through the document, since JAWS is only looking at one page at a time. Or, if a list or a data table spans more than one page, you may not be able to use the JAWS list or table navigation features as you would expect.

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[6] https://helpx.adobe.com/acrobat/using/keyboard-shortcuts.html#keys_for_navigating_a_pdf

[7] https://www.adobe.com/content/dam/acom/en/accessibility/pdfs/accessing-pdf-sr.pdf

To avoid these issues, you will want to configure your PDF software – either Acrobat Reader or Acrobat Pro – to read the entire document instead of only the currently visible pages.

The Downside

If you set your Acrobat software to read the entire document, it may take longer for JAWS to process it. For very large documents, this may take several seconds or even a minute.

In those cases, you might want to reset your configuration to read only the visible pages. If the PDF file is well structured, you may be able to use the PDF bookmarks to navigate the document rather than depending on the headings.

Configure Acrobat Reader DC (Simple Method)

Below are the steps to set Acrobat Reader DC to read the entire document:

1. Open a PDF in Acrobat Reader DC.

2. Go to **Edit** > **Accessibility** > **Change Reading Options**.

3. In the Change Reading Options of Current Document dialog, select the **Read the entire document** radio button.

4. Press **Enter** to save the changes.

Configure Acrobat Reader or Pro DC (Advanced)

Below is a more advanced way to configure the **Read the entire document** option. This method works for both Acrobat Reader and Acrobat Pro DC.

1. Open a PDF in Acrobat Reader DC or Adobe Acrobat Pro DC.

2. Press **Control + K** or go to **Edit** > **Preferences** to open the Preferences dialog.

3. In the Categories list, select **Reading**.

4. **Tab** to the **Page vs Document** combo box, found in the Screen Reader Options section.

5. Select **Read the entire document** in the combo box.

6. **Tab** to the **OK** button, and select **Enter** to save the changes.

Configure Acrobat Reader or Pro DC (Even More Advanced)

You may have noticed another option in the Page vs Document combo box called **For large documents, only read the currently visible pages**. This option gives you a little more control over when JAWS will process the entire document and when it will read only the current visible pages.

If you select the **For large documents, only read the currently visible pages** option, you will also need to set the option called **Minimum number of pages in a large document**. Once you set both of those options, JAWS will only process the entire document if it is less than the number you specified in the **Minimum number of pages** field. If the number of pages in the document exceeds that threshold, JAWS will read only the currently visible pages.

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If you choose this more advanced option, you must remain aware that some documents will act differently than others. The most noticeable difference is usually that the JAWS heading navigation feature works in some smaller documents, but not in larger documents.

Set PDFs to Open in Acrobat Pro or Reader

Windows 10 is set by default to open PDFs in Microsoft Edge. Acrobat functions do not work correctly in Edge, so we recommend setting your computer to open PDFs in Pro or Reader.

Go to [Make Acrobat or Reader the default owner of PDF files on Windows 10](8) for the steps to change this setting.

Change Internet Explorer Settings for PDF Files

We recommend setting your Internet Explorer options to open PDF files in Adobe PDF Reader (as opposed to a browser window). To change the default behavior in Internet Explorer, you must disable the Adobe PDF Reader add-on. Follow these steps:

1. Open Internet Explorer, and choose **Tools** > **Manage Add-ons**.

2. Under **Add-on Types**, select **Toolbars and Extensions** (should be selected by default).

3. In the **Show** dropdown menu, select **All Add-ons**.

4. In the list of add-ons, select **Adobe PDF Reader**.

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[8] https://helpx.adobe.com/acrobat/kb/not-default-pdf-owner-windows10.html

5. Select the **Disable** button which turns off the add-on so it does not open PDFs in the browser.

Conclusion

That's it in a nutshell. Pretty simple, right? We know, we know; it's a lot. Even though it seems like a lot of information, you will probably still have scenarios that fall outside the scope of this document. Feel free to email us[9] with questions.

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[9] accessibility@twc.state.tx.us

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