



**Scottish Accessible
Information Forum**

Making Websites Accessible

Guidelines for creating and maintaining accessible websites

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Introduction

The Web is now part of the mainstream, along with other digital communication channels (e.g. email, text, electronic documents). This guide aims to help you develop your website to communicate in the most accessible and effective way.

We are not advocating that you should only communicate electronically. There will always be people who prefer more traditional 'off-line' communication methods. Providing alternative formats will help ensure your information remains accessible to a wide range of people with different communication needs.

It makes sense to build accessibility into your website from the start as it is both cheaper and easier than trying to add it later (although of course you can). The best way to achieve this is to adhere to existing good practice. In terms of building websites much of that good practice can be found in the Web Content Accessibility Guidelines (WCAG) published by the World Wide Web Consortium (W3C) and the good practice guidelines published by The British Standards Institute.

What this guide covers

This guide provides an introduction to:

- what 'accessible web design' means
- what standards and guidelines are available
- how to choose a website designer
- what should be in your tender document
- how to check the accessibility of your website
- where to get further help.

What is accessibility?

In the context of the web, accessibility is about trying to ensure that the electronic information you produce is accessible to the widest possible audience. The key to accessibility is to make the presentation of your content flexible, so that users can change it to suit their own needs.

For example, a person with dyslexia might find it useful to alter the font you have used, or change the background colours or the size of the text. It will be helpful to a person using a screen reader if your content is well structured and your links all make sense when read out of context; it will make it quicker and easier for them to access your content.

An accessible website will mean that people using assistive technologies will not be excluded from your content. For example, many people browse the web using screen readers, magnifying software, braille printers, keyboard only software, switches and other assistive devices.

It is also important to think about accessibility in the wider sense, i.e. your website should be quick to load, well organised, attractive, user-friendly and use clear language.

Industry guidelines

World Wide Web Consortium

Guidelines for accessible websites are produced by the World Wide Web Consortium (W3C). Their Web Content Accessibility Guidelines (WCAG) provide an excellent resource for anyone building an accessible website and using related technology. We recommend them as the 'official' resource for those engaged in the technical aspects of building websites. You can find out more at <http://www.w3.org/WAI>

PAS-78

Another document worth referring to is the PAS-78 (Publicly Available Specification) produced by The British Standards Institute (BSI). This document provides a set of recommendations, with common sense advice to people in charge of commissioning websites.

However, not only should websites be accessible to end users, but the way they are updated should also be accessible. In addition to the WCAG it is also good practice to be familiar with the Authoring Tools Accessibility Guidelines, more information on which can be found at section 6.4.3 of the PAS-78.

BS 8878 Web Accessibility – Code of Practice

In December 2010 BSI launched the first British Standard to address web accessibility and the challenge of digital inclusion.

The standard has been designed to introduce non-technical professionals to improved accessibility, usability and user experience for disabled and older people. It will be especially beneficial to anyone new to this subject as it gives guidance on process, rather than on technical and design issues. BS 8878 is consistent with the Equality Act 2010 and is referenced in the UK government's e-Accessibility Action Plan as the basis of updated advice on developing accessible online services. It includes recommendations for:

- involving disabled people in the development process and using automated tools to assist with accessibility testing
- managing the guidance and the process for upholding existing accessibility guidelines and specifications.

More information on PAS-78 and BS 8878 can be found at:
<http://www.equalityhumanrights.com/footer/accessibility-statement/general-web-accessibility-guidance/>

Accessible web design

What is meant by accessible web design?

Internet delivery of information and services is replacing more traditional methods. As alternative methods disappear, so does choice. Therefore it becomes critical to ensure that new delivery methods are accessible to the widest possible audience.

Multimedia-rich sites can be inaccessible to many disabled people; e.g. a visually impaired person who uses a speech synthesiser will not be able to 'hear' the content of an image unless that image has a text label associated with it.

Create a website design that is flexible

You will not be able to predict the needs of all the visitors to your website. So the best design is one that visitors to your site will be able to modify to suit their own needs. For example, check that colours, font and font size can be changed using your web browser preferences. If the text size can't be changed, it means your site might not be accessible to someone who has a visual impairment.

Separate layout and content

The best way to create a flexible website design is to use cascading style sheets (CSS) to style text and to determine the layout of the pages. Cascading style sheets work like the styles in Microsoft Word, i.e. you can use them to add visual formatting to your pages. By using CSS you separate the content, i.e. the actual information, from how you present that information. Your default presentation and layout may work very well for a lot of people who visit your site, but not for all. A user who needs a different contrast or colour scheme to access the information can change the style sheet and adjust it to his/her own requirements.

Choosing a web designer

Finding an individual or organisation with a thorough understanding of what makes an accessible website and who can help you build one is not an easy task.

The Guild of Accessible Web Designers' website has a page listing all of its members, so this would be a good place to start:

<http://www.gawds.org/listmembers.php>.

There is also a search facility on the site to help you find a web designer in your area.

You will need to do some research to find designers that meet your organisation's needs. You can do this research in a number of ways: by asking other organisations who have used web designers for recommendations, by surfing the web yourself to find out which sites you particularly like and finding out who designed them; and by following up on companies that advertise the fact that they build accessible websites.

Once you have found a selection of possible designers and looked at some of the websites they have built to see if you like them, run them through the 'Cynthia Says' accessibility checker at

<http://www.cynthiasays.com/default.asp>

to verify their access claims. Expect even the most accessible websites to throw up some validation and accessibility errors as it is almost impossible to keep a working website completely error free. Look at the number and severity of any errors you find. A dozen errors is not a lot, while hundreds of errors should indicate there may be problems.

Questions to ask

When you have your list of likely candidates, contact them for further information. Here are some questions you could ask:

- What experience do they have of working with organisations in your sector?
- What will be the total cost of design? You should have a good idea of how many pages, graphics and features you will be wanting on your site.
- Who have they previously designed websites for?
- How will you update pages or add pages to the website?
- Will you be able to update the site yourself?
If they do not provide a way for you to update your own site get a clear indication of how much it will cost to get them to add or edit information on the site. Specify in your tender document that any updates to the website must also be accessible.
- Do they carry out accessibility and usability tests of the website?
- Do they provide visitor statistics?
- Will the site have interactive features like integrating with Facebook, twitter, e-commerce integration, events diary and so on. The use of these features will depend on your organisational needs so you should not assume that these are essential features.
- Will the site be an accessible website?
- What level of conformance with the World Wide Web Consortium's Web Content Accessibility Guidelines (WCAG) will the site have?

If the web designers claim to design in accordance with WCAG there should be no hesitation in providing this information.

Website tender documents

Specify as a condition of your tender document that the resulting website must conform to the World Wide Web Consortium's (W3C) Web Access Guidelines available at <http://www.w3.org>

The W3C produces a set of guidelines called the Web Content Accessibility Guidelines (WCAG), which outline three levels of accessibility compliance for websites, with the first level being the least accessible. There is some debate on what level of conformance is appropriate. We recommend that you aim for at least WCAG 1 AA and/or the equivalent for WCAG 2.

An inaccessible website places your organisation at risk of not complying with the Equality Act (2010) - and therefore at risk of a complaint from a disabled person.

We would suggest that the following information is added to your tender documents:

- Comply with the Web Content Accessibility Guidelines (WCAG) version 1.0 AA or the WCAG 2 equivalent. This requirement helps to ensure that the content of websites will be flexible enough to adapt to unpredictable user needs.
- The website must be created using valid (X)HTML. This requirement provides the best chance that sites will work on all hardware platforms and all web browsers.

User testing

Websites may pass accessibility tests but still place some disabled people at a 'substantial disadvantage' when compared to their non-disabled peers. The tender document should also make provision for comprehensive testing and consultation with disabled users from the start to ensure the site is usable and accessible in practice.

User testing is emphasised as a valuable element of accessible website design in the PAS-78. In practice it can add considerably to the costs of the design; which is not to say you should not do it. You may have to be imaginative in your approach, e.g. working in partnership with the designer to identify disabled users who can act as website testers and/or provide access to a computer and room for testing.

Web accessibility issues for particular groups

People with a visual impairment

The access needs of visually impaired people are extremely variable. Flexibility therefore is the key to ensuring that your website is accessible to as many people as possible. People with some vision may need to be able to enlarge text (or make it very small), or change the contrast or colours on the web page. Others will access web pages using software which converts text into synthesised speech or makes it accessible via a braille display.

You must ensure that the design of your web pages does not make it difficult for a person with a visual impairment to be able to customise the page for his/her own needs.

Designing a website to be accessible to a person with a visual impairment - or indeed for anyone - can be a complex subject. The following general principles apply to designing for users with a visual impairment, but are just as relevant to all groups:

- Provide text equivalents for all non-text objects on the page - speech synthesisers can't read graphics, and graphic text can't be enlarged in the same way as ordinary text. All graphics should have text labels, i.e. alt-tags, alternative attributes in HTML (Hyper Text Mark-up Language).
- Don't design the page in a way that stops users from setting their own browser preferences, i.e. don't specify exact sizes for fonts or layouts - design everything in relative sizes.
- Use valid HTML and add structure to your pages by using the correct tags for headings, paragraphs, lists and so on. Many access software programs depend on the content of the pages being marked up correctly. Some software can give an overview of the page by extracting all the headers and links and presenting them on a single page. If you have no headers on your page and all your links say 'click here' then the accessibility of your website will be very low.

There is very useful, more detailed information about designing for users with visual impairment at:

http://www.rnib.org.uk/professionals/webaccessibility/designbuild/Pages/design_build.aspx

Deaf/deafened/hard of hearing people

Although it may not be immediately obvious how a predominantly visual medium like the web can be inaccessible to people who are deaf or hard of hearing, there are some points worth noting.

Many deaf or hard of hearing people - particularly if they are British Sign Language (BSL) users - may not have highly developed reading skills. The use of simple, clear language will help to ensure that deaf or hard of hearing people can access the information on your web pages.

If you use audio or video, provide text-based transcripts and closed captioning. Closed captioning on the web when not directly embedded within the video consists of a link to a 'script' of the video - the link to the script should be located close to the video clip.

Guidelines for implementing captioning for video can be found at <http://www.samizdat.com/pac2.html>

in an article by Mike Paciello. For more detailed information about web accessibility for deaf people, see <http://www.zak.co.il/deaf-info/old/home.html>

Physically or mobility impaired people

For people who have difficulty using their hands or whose hand/eye co-ordination is restricted, the following guidelines can improve access:

- Provide a large 'target' area for links. This target area could mean using buttons rather than text links for navigation or ensuring that text links are large enough or can be resized by visitors.
- Clear consistent layouts and navigation.
- Remember to consider the physical access to the computer itself. If a website is being designed for use in a public kiosk, the kiosk should be accessible to wheelchair users.

People with learning disabilities

There are marked differences in cognitive skills between individuals with learning disabilities. However, there are some general rules worth applying.

Design simple uniform screen layouts with the option of only viewing one thing at a time. Use plain language and avoid pages overloaded with too many distractions or too many choices. For the same reason avoid long lists of links unless they are arranged in logical groups of no more than five or six links each.

The combination of auditory information, pictures and text helps to reinforce navigation and actions. This combination will also be useful for people who cannot read or are surfing the web with assistance. Auditory information should be clear, simple and repeatable.

Other suggestions include:

- providing a plain language description of the site
- including a simple way to return to your home page
- avoiding animated graphics
- simplifying sequences - limit the choice and number of steps.

Checking website accessibility

The following instructions are for guidance only. Reliable interpretation of website accessibility test results will require both technical expertise and experience gained from working in the area of accessible website design.

You can check the accessibility of a website by using free tools, online resources and your own web browser application.

For example, you could install the Internet Explorer Accessibility Toolbar in your browser. The Toolbar is free for non-commercial use. You can get the toolbar from <http://www.visionaustralia.org.au/ais/toolbar/>

Check the HTML

If the markup of a web page has errors in it the page may not work on all web browsers. Therefore it is important to check how well it has been coded.

Check the version of HTML being used on the page. The 'DOCTYPE' will tell you which version of HTML the developer used to code the page (for example, HTML 4.1 Strict or XHTML 1 Transitional). You can get this information in two ways:

- Access the DOCTYPE via the accessibility toolbar (go to DocInfo then Show DOCTYPE).
- View the source code by clicking the 'Source' button in your accessibility toolbar. Look at the first line of code.

Check the home page for any coding errors by running the World Wide Web Consortium (WC3) code validator. Select Validate, then W3C HTML Validator using your accessibility toolbar. You can then get an idea of how many errors there are and a sense of their severity.

Check the Cascading Style Sheet (CSS)

On a website designed to be flexible enough to meet the needs of different users the content of the page will be separated from the way that it is presented. It is the Cascading Style that determines how the page looks (to a sighted viewer) and the order in which the content is presented. Select Validate, then W3C CSS Validator using your accessibility toolbar.

Check the page structure

Each web browser has its own built in style sheet, ensuring that headings are bold, lists have bullets, links are underlined and so on. If the page elements have not been associated with the correct tags (e.g. headers marked using h1, h2, h3 and so on) this makes the page much more inaccessible to people using screen readers.

The reason is because screen reading software allows users to summarise content by showing headers and the relationships between those headers. If headers have not been tagged appropriately then it will be much harder to access the content.

Turn the styles off: CSS/Disable CSS. Check the reading of the order of the unstyled content. Does it still make sense? Check the structure of the page in terms of the existence of headings and lists etc.

Using your toolbar, display the document structure. Go to Structure, then Heading Structure, Structure then List items.

Check how the page works on different screen sizes

Use your toolbar to change the screen size (under Resize) or visit <http://www.anybrowser.com/ScreenSizeTest.html> to see if you can still see all the content on smaller screen sizes. Is there a need to scroll horizontally to see all content?

Check how your website will look on a mobile phone:
<http://mtld.mobi/emulator.php>

Also try

<http://www.operamini.com/demo>

(type your web address into the phone then click on the menu button).

Check the colour contrast

View the page as greyscale. Go to <http://graybit.com/main.php> and then type in your web address, (or print to a black and white printer).

Check for problems in the colour contrast using the following website tools:

- <http://www.accesskeys.org/tools/color-contrast.html>
- <http://juicystudio.com/services/colourcontrast.php>

You can also check colour contrast problems using the accessibility toolbar. Go to:

- Colour then Greyscale
- Colour then Contrast Analyser
- Colour then Juicy Studio Contrast Analyser

High contrast is not always the answer. Many people with dyslexia find that high contrast text is impossible to read so adopting a simple approach of seeking high contrast between text and background will not ensure your pages are accessible.

Printing issues

If the page has white text on a black background check that the page can be printed. Often white text on a black background results in a blank page coming from the printer because the printer doesn't print the web page backgrounds by default (i.e. you end up with white text on a white background).

Check that you can change the colours on the page from your browser

When changing colours you will first have to change the accessibility options in your browser:

- Select the Tools menu.
- Select Internet Options.
- Select the General tab.
- From the Appearance section, click ACCESSIBILITY.
- Select the appropriate checkboxes to override font styles, colours and/or font sizes.
- Click OK to close the Accessibility dialog box.
- Click OK to close the Internet Options dialog box.

To change the colours in Internet Explorer 7:

- Select the Tools menu.
- Select Internet Options.
- On the General tab, select the Colours button. Remove the check mark from the Use Windows colours check box.
- Choose a text colour by selecting the colour box next to Text and then choosing from the available colours.
- Choose a background colour by selecting the colour box next to Background and then choosing from the available colours.
- Choose a visited link colour by selecting the colour box next to Visited and then choosing from the available colours.
- Choose an unvisited link colour by selecting the colour box next to Unvisited and then choosing from the available colours.

Colour blindness check

Check how the page would look to someone with the most common forms of colour blindness. Use the toolbar to run the colour blindness simulator: Contrast/Vischeck Colour Blindness Simulator.

Common colours that cause problems when used together are red on green (or green on red) and yellow on blue (or blue on yellow).

Using colour to convey information

If colour is used exclusively to convey information about a particular aspect of a website, it can cause accessibility problems for people with colour blindness, e.g. on a form you might write 'fields with red borders are compulsory and those with green are optional'.

Check that you can change the font used on the website

For some people, being able to alter the font on a web page is the difference between accessible and inaccessible content.

You should check that it is possible to change the font used on the web page via the browser preferences.

To change the font:

- Select the Tools menu.
- Select Internet Options.

On the General tab:

- In the Appearance section, click Fonts. The Fonts dialog box appears.
- From the Webpage font list, select the desired font.
- From the Plain text font list, select the desired font.
- To save changes and close the Fonts dialog box, click ok.
- To close the Fonts dialog box without saving, click Cancel.
- Click OK.

Check that all images have appropriate labels

Use the toolbar to turn off images and show labels for all non-text elements: Images/Toggle Image/alt.

Check the website on text only browsers

A text browser will give you a good idea of how the content will be read out to someone using a screen reader. Instead of pictures you will only see the labels for those pictures.

Check how the page looks on a text only browser at http://www.yellowpipe.com/yis/tools/lynx/lynx_viewer.php

Reading a page using a screen reader is a very linear experience; the user starts at the top of the page and works through the document to the bottom of the page. When using a screen reader it is much harder to scan content and to jump around the page.

It is therefore important that the content is well organised, that it has been chunked into sections with headings and that the navigation structure is consistent.

Check if the text can be resized

In Internet Explorer:

- Select the Page menu.
- Point to Text Size.
- Select your choice of Largest, Larger, Medium, Smaller, Smallest text sizes.

Are you able to change the text size at all? At larger sizes does the layout break? Are sizes set using relative units? At the smaller size is the text still readable?

Check that the text size is set using relative units, e.g. %, em or description (e.g. small).

Check that the link text makes sense when it is read out of context

One of the most common accessibility faults is having many links on a page that say 'click here'. Screen software can extract all the links on the page and read them out in the order they are presented. If all the links say 'click here' it makes the site very difficult to navigate for screen readers.

Check the accessibility of scripts

Use your toolbar to turn off Javascript. Go to Options then Toggle Javascript.

Check that the navigation still works. Try filling in a contact form and submitting it. Does it still work? When you click on external links, do they still work? (Often Javascript is used to open new windows for external links).

Opening a new window when a link is clicked can be a problem for people using screen readers. Without the aid of vision they may not be aware that a new window has opened. Opening a new window breaks the back button function and can lead to confusion as the picture they had built up about where they were in the site breaks down.

If a new window is opened, it is recommended that users are warned first, e.g. in the link it could say 'link opens in a new window'.

Check that forms are accessible

Screen reader users can have particular difficulties with forms, e.g. if labels are not clearly associated with their form elements or the order of form fields doesn't make logical sense.

Two quick checks for forms:

- Click on the form labels and check to see the form controls get focus (is the cursor in the text area or does the checkbox get checked).
- Turn off Javascript in your browser and check that you are still able to fill in and submit the form.

A common problem is using Javascript for form validation in a way that makes it impossible to submit the form if Javascript is disabled.

Use online accessibility checkers

Check your web pages using at least two accessibility checkers. You will find a list at <http://www.w3.org/WAI/ER/tools/#General>

You can also access several tools directly via the accessibility toolbar:

Tools /The Wave, Tools /AccMonitor, Tools /Webxact / Bobby, Tools /Torquemada.

Tips for checking website accessibility

Check:

- All non-text elements have appropriate labels.
- Pages are coded without errors.
- Links make sense when read out of context.
- Presentation can be changed to suit visitors' needs (e.g. text size, colours, font and so on).
- Navigation is consistent and usable.
- Headings and other page elements are marked up properly.
- Content is well organised and sections have descriptive headings.
- Contrast is adequate and colours don't cause problems for people with colour blindness.
- Content and interactive elements (e.g. forms) still work when Javascript is disabled.
- Equivalent alternatives are provided for multi-media elements, e.g. transcripts for video and audio.

WCAG 2: What is it and should you be using it?

The Web Content Accessibility Guidelines 2 (WCAG 2) are based on 4 accessibility principles. Website content must be:

- perceivable
- operable
- understandable
- robust.

For each principle there are guidelines. For each guideline there are testable 'success criteria'. For each guideline and success criteria there are related techniques.

Should you be switching to WCAG 2 instead of WCAG 1?

As of 2011, many web developers have not started using the WCAG 2 guidelines as they have proved to be difficult to understand (due in part to the difficult language used and the complexity of the documentation). The writers of the guidelines have tried to avoid making them specific to any particular technology, i.e. not specifically for the evaluation of HTML pages. This policy has also proved to be a weakness of the guidelines as far as web developers are concerned.

However, it is expected that WCAG 2 will gradually become more accepted and used as more people write easy to read guides and help documents. Bear in mind that a website passing WCAG 2 is not more accessible than one passing WCAG 1 as they are designed to do the same job.

Can you continue to assess websites against the WCAG 1 guidelines?

The WCAG 1 guidelines are still valid guidelines to test websites against. They are still being used by the majority of accessibility auditors for the evaluation of websites.

Where to get more help

Jim Byrne & Associates

Web consultancy and training organisation specialising in accessible websites, the designer of the SAIF website and the co-author/editor of this guide.

<http://www.jimbyrne.co.uk>

Royal National Institute of Blind People (RNIB)

The RNIB has a range of very useful guidance notes as part of its See It Right accessible websites campaign. These guidance notes contain lots of advice about building websites that do not exclude visually impaired people.

<http://www.rnib.org.uk>

The Guild of Accessible Web Designers

A world-wide association of organisations and accessible web designers and developers.

<http://www.gawds.org>

Web Accessibility Initiative (WAI) at W3C

WAI offers a vast range of resources that will be helpful whether you are a complete novice or a technical wizard, including accessibility checkers like WAVE and Bobby.

<http://www.w3.org/WAI>

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