NOT YET SCHEDULED FOR ORAL ARGUMENT

No. 22-7063

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

American Society for Testing and Materials; National Fire Protection Association, Inc; American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.

Appellants,

v.

Public.Resource.Org, Inc.,

Appellee.

Appeal from the United States District Court for the District of Columbia
Hon. Tanya S. Chutkan, Case No. 1:13-cv-1215-TSC

ADDENDUM TO AMICUS BRIEF OF PRIME ACCESS CONSULTING, INC. IN SUPPORT OF APPELLEE PUBLIC.RESOURCE.ORG

Blake E. Reid
SAMUELSON-GLUSHKO TECHNOLOGY LAW & POLICY CLINIC AT COLORADO LAW
Counsel for Amicus Curiae Prime Access Consulting, Inc.
404 UCB
Boulder, CO 80309-0404
303-492-0548
blake.reid@colorado.edu

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Accessibility Review of Standard Developing Organizations Reading Rooms and Associated Portals and Documents REV-1

Statutes and Regulations

I. The Rehabilitation Act of 1973

A. Section 504 (29 U.S.C. § 794)—Non-discrimination under federal grants and programs

> **(a) Promulgation of rules and regulations**
> No otherwise qualified individual with a disability in the United States, as defined in section 705(20) of this title, shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service.

B. Section 508 (29 U.S.C. § 794d)—Electronic and information technology

> **(a) Requirements for Federal departments and agencies**
> **(1) Accessibility**
> **(A) Development, procurement, maintenance, or use of electronic and information technology**
> When developing, procuring, maintaining, or using electronic and information technology, each Federal department or agency, including the United States Postal Service, shall ensure, unless an undue burden would be imposed on the department or agency, that the electronic and information technology allows, regardless of the type of medium of the technology—
> . . .
> **(ii)** individuals with disabilities who are members of the public seeking information or

services from a Federal department or agency to have access to and use of information and data that is comparable to the access to and use of the information and data by such members of the public who are not individuals with disabilities.

II. The Americans with Disabilities Act of 1990 (42 U.S.C. § 12182)—Prohibition of discrimination by public accommodations

(a) General rule

No individual shall be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation by any person who owns, leases (or leases to), or operates a place of public accommodation.

(b) Construction

(1) General prohibition

(A) Activities

(i) Denial of participation

It shall be discriminatory to subject an individual or class of individuals on the basis of a disability or disabilities of such individual or class, directly, or through contractual, licensing, or other arrangements, to a denial of the opportunity of the individual or class to participate in or benefit from the goods, services, facilities, privileges, advantages, or accommodations of an entity.

PRIME ACCESS CONSULTING, INC.

Sina Bahram, President
Sina@SinaBahram.com

Accessibility Review of Standard Developing Organizations Reading Rooms and Associated Portals and Documents

September 21, 2022

Introduction

This document enumerates some accessibility concerns exhibited by eleven reading rooms reached using the main ANSI portal found at https://ibr.ansi.org/, many of which will represent potential blockers for one or more user groups, such as:

- Blind site visitors that must explore content using a screen reader.
- People with different levels of dexterity or range of motion that might be using a keyboard or a switch device or might interact with the content through voice commands processed by speech-input software.
- Users with reading, cognitive or learning differences.
- Folks with vestibular conditions, which may be sensitive to increased movement on a page.
- Visitors with low vision that require text to be presented with sufficient color contrast or might need to rely on display customization settings and larger font sizes.
- People with color blindness that cannot distinguish information revealed using color.

Each observation includes:

- the description of the non-compliant behavior;
- links to one or more failed WCAG success criteria; and
- the impact on various user groups.

Please see Appendix: Failed Success Criteria for a listing of all WCAG 2.1 level A/AA requirements that are not met and have been deemed as most impactful.

The report does not represent a formal accessibility audit or exhaustive review. We may refer to components or page sections used within the product by name throughout. Please also note that the environment under evaluation may have undergone additional changes since the evaluation results in this report were recorded; the date on this document reflects its completion and delivery, and not the date(s) during which the assessment was carried out.

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Severity Numbers

Each observation in this document has been assigned a severity level from 1 (most) to 3 (least). This is intended to indicate the likely impact on users, as follows:

- Severity level 1 represents behavior which will either prevent a user from carrying out a task, or drastically decrease the effectiveness with which they are able to do so.
- Severity level 2 is applied to issues which are likely to cause significant frustration or confusion, but in a non-blocking fashion given enough time, experimentation, or assistance.
- Severity level 3 is reserved for aspects which are demonstrably problematic but will have the least noticeable impact on users. For example, this could be because a specific set of circumstances is required to trigger the behavior, or because users are likely to be well-versed in appropriate workarounds. However, it is critical to note that the presence of a high number of severity 3 items can substantially degrade a user's experience.

These levels do not take into account the amount of effort or development time required for remediation, and are only intended as a guide to inform potential prioritization of resource allocation and scheduling.

User Journey

ANSI portal

URL: https://ibr.ansi.org/

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Find links that lead to various reading rooms
3. Select a reading room in the "Hosted by ANSI" section
4. Complete the Registration form
5. Open the "View Only" PDF for any documentation using Adobe Acrobat and the FileOpen Acrobat plug-in
6. Purchase a document on the ANSI Webstore site.

Incomplete Semantic Mark-Up

Severity: 1

The pages are visually structured into distinct sections that serve a specific purpose, such as the page header, site navigation, main content, and footer. These regions are not marked up in a programmatic way, so that the same information can be conveyed to blind screen reader users. Additionally, while some visual headings are provided, the heading structure is either incomplete or inaccurate due to some incorrect heading levels.

Fails
1.3.1 Info and Relationships (level A)

User Impact
Without sight, screen reader users cannot determine how content is structured on a page. Additionally, without the appropriate semantic mark-up for headings and regions, users cannot effectively skip to a specific section. Instead, they must explore the page in a linear manner and try to determine the relations between elements, which are visually obvious. This increases the cognitive load for using the site and the time spend to reach the intended documentation.

Lack of Focus Indicator on Navigation Links
Severity: 1

When users press Tab or Shift+Tab through the page there is no visual cue to indicate when the main navigation links are focused. The default focus outline is removed from the "About the IBR Portal", "Hosted by ANSI", "Hosted by SDOs", "FAQ" and "Contact" links using the CSS "outline-style: none". There is no custom focus indicator provided to replace the browser's default outline.

Fails
2.4.7 Focus Visible (level AA)

User Impact
Folks with different levels of dexterity that interact with the site using a keyboard cannot determine when the links are focused so they can access those pages on the website. When users cannot see the focus indicator, they will unintendedly interact with the wrong element resulting in a time consuming and frustrating experience.

Missing Text Alternatives for Logo Links
Severity: 1

Some logo links in the "Hosted by ANSI" and "Hosted by SDOs" sections use an alt attribute with an empty value meaning that there is no text alternative available for those images and no accessible names for the logo links.

Fails

- 1.1.1 Non-text Content (level A)
- 2.4.4 Link Purpose (In Context) (level A)

User Impact

When blind screen reader users reach those links, instead of hearing a descriptive name that clearly indicates the link's destination, they will hear part of the URL for link's target which can be confusing and irrelevant. For example, the "AISC, the American Institute of Steel Construction" logo link is announced with the name of "publications" which does not convey the information seen in the logo image.

Use of Color to Convey Presence of Links

Severity: 1

The presence of links within paragraphs is conveyed using blue text (/*#E74B3A;*/#1E6A9D), but the default underline decoration is removed via "text-decoration: none" styling. There is no alternative provided to help users identify links when they cannot perceive the color change, including on keyboard focus and mouse hover.

Fails

1.4.1 Use of Color (level A)

User Impact

For site visitors with low vision or color blindness, the links look very similar or the same as the surrounding text in a paragraph, meaning that such users may not be able to determine that text with the mentioned styling is actionable. This leads to an inequitable experience, as users that miss those links, have to look for alternate ways to find intended content.

Missing Programmatic Label for "Registration" Form Fields

Severity: 1

All input fields or single-select elements in the "Registration" form lack a programmatic association with their visible label meaning that there is no indication of the input purpose. The form is implemented using a layout table structure with the form labels displayed in the second column, and the form fields on the fourth column.

Fails

1.3.1 Info and Relationships (level A)

User Impact

The impact is severe since the form contains fifteen form controls that lack an accessible name. When blind screen reader users reach the form fields, they are announced only with their role such as a text field or combobox, and the entered value. It is currently very difficult to determine which label belongs to which field and what information needs to be entered. This will prevent users from successfully submitting the form since the chance to encounter errors is significantly increased.

Inaccessible Error Handling

Severity: 1

When the "Registration" form is submitted with invalid data, error messages are listed above the form, however they are not surfaced in an accessible manner so that screen reader users become aware of their presence or updated content when the form is resubmitted. Additionally, error messages are not programmatically associated with the corresponding fields to assist users in correcting the entry.

Fails

- 1.3.1 Info and Relationships (level A)
- 3.3.1 Error Identification (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Users without sight, which must rely on a screen reader to fill out the form will find it extremely difficult if not impossible to complete the "Registration" form. In addition to hearing the fields without a label, users must manually locate the error summary on the page, then try to find the correct field and remember how to fix the error.

Problematic Instructions for Opening PDF

Severity: 1

In order to access the read-only copy of the standards, users must download the FileOpen plug-in and the Adobe PDF Reader. There are no clear instructions on how to open the file once downloaded and all that is mentioned is:

- On the FAQ page: "Click 'Download file' button which will bring up a read-only PDF copy of the standard."; or
- On the "Download PDF Standards page": "Due to the requirements of some standards publishers, some standards or codes purchased through the ANSI Web Store are encrypted and "locked" to the device upon which they are first

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PAC Sina@SinaBahram.com

> opened using Digital Rights Management (DRM). This prevents the copying of the document to another device. These DRM-protected documents will only open if both Adobe Acrobat and the free FileOpen Acrobat plug-in are installed on your device.". This text is displayed using light grey text with very low color contrast.

In the Chrome browser, when the user selects the downloaded file, it opens the PDF Viewer with the message "Error Failed to load PDF document.". At this point the user has installed all required software, downloaded the file, and cannot read it. This is a severe impediment since nowhere in the instruction it is stated clearly that users must open the file from the download location using Adobe PDF Reader.

Fails

3.3.2 Labels or Instructions (level A)

User Impact

Users that are not familiar with the default device settings will think that the PDFs are broken and cannot be accessed. This issue will be encountered by many users due to the popularity of the Chrome browser that has its own PDF viewer.

Problematic PDF Documents

Severity: 1

There are several accessibility issues that relate to the "view-only" PDFs:

- Content is not tagged to ensure that appropriate semantic mark-up is used, and that the reading order is meaningful.
- The document language or title are not set.
- Mathematical equations do not make sense when reached with a screen reader.
- Text alternatives are not provided for images, diagrams, charts, or graphs.
- Tables and lists are not marked up correctly.
- Incorrect nesting is flagged for many elements.
- Visual headings are not implemented as semantic headings.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 2.4.1 Bypass Blocks (level A)
- 2.4.2 Page Titled (level A)

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- 3.1.1 Language of Page (level A)
- 4.1.1 Parsing (level A)

User Impact

When a document is reviewed using a screen reader, it can be difficult or impossible to understand the information in the PDFs:

- Mathematical formulas are sometimes the primary content of a standard, as noted in the case of the "ANSI S3.22-2003 (Errata) Erratum to ANSI S3.22-2003 American National Standard Specification of Hearing Aid Characteristics". They cannot be accessed at all by a blind screen reader user, who will hear random meaningful digits and/or some symbols.
- Images such as diagrams are completely inaccessible for someone that cannot rely on sight.
- Information in data tables is in many cases not communicated in the context of their visual column headers, meaning that such data will be difficult or impossible to process.
- The lack of heading mark-up is especially problematic when it comes to finding content in such large documents containing hundreds of pages.
- The reading order is sometimes incorrect when content is positioned on two columns. Instead of hearing the content of the column to the right-side first, followed by the one on the left-side, unrelated parts of text from both adjacent blocks are interposed in the reading order. The resulting screen reader output is difficult or impossible to comprehend.

Inaccessible ANSI Webstore

Severity: 1

Those that wish to purchase a document on the ANSI Webstore site, or must resort to this flow due to impediments encountered with the ANSI portal, are faced with additional accessibility problems:

- Many checkboxes and radio buttons are hidden with "display: none" and custom ones are present. Such controls cannot be reached using the keyboard when pressing Tab or Shift+Tab, such as:
  - The "Accept End User License Agreement" checkbox, which is required in order to complete the checkout flow. This fully blocks keyboard-only users from completing the order;
  - "Keep me signed in" checkbox on the Sign in page; and
  - The payment options radio buttons on the Cart page, "Pay by Credit card" and "Pay by Deposit account". Since "Pay by Credit card" is

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selected by default keyboard-only users must proceed with this form of payment.

- Input fields in the "Sign in" and "Create new account" forms are missing a visible and programmatic label. They rely on placeholder text that:
  - is inconsistently supported across browsers;
  - is no longer present once a value is entered, meaning that once the form is filled out it cannot be reviewed since all fields have no labels; and
  - is displayed with a very low color contrast ratio and is hard to read by many users especially folks with low vision.
- Input fields in the "Billing Address" form have visible labels but are not associated with the fields. They also rely on the placeholder value for an accessible name. Here the placeholder text can be additionally problematic, especially in the case of the "City" text field where its value is "New York" which is confusing for everyone:
  - Sighted users might think that they must be located in New York to proceed; while
  - Screen reader users will hear the field announced as "New York, edit, blank" when empty and if a city is typed in, such as Atlanta, the announcement is "New York, edit, selected Atlanta" (NVDA with Chrome).
- The native radio buttons in the "Create new account" form, are assigned the same ID value (id="AccountType") affecting the programmatic association of the radio buttons with their visible labels meaning that it cannot be conveyed correctly for screen reader users.
- Many controls throughout the site have no accessible name and are only announced as "button" or "link" when using a screen reader with no indication of their purpose. Examples include:
  - the social media links in the header and footer;
  - the search button; and
  - the cart link.
- Some controls are implemented using non-semantic or elements that cannot be reached at all using a keyboard with or without a screen reader. This is the case for:
  - The carousel navigation controls on the home page;
  - The delete buttons in the cart; and
  - The password visibility toggle button.
- There is no visual indicator for the keyboard focus for most of the controls, meaning that users cannot determine the focused element.

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- The "Products" control in the main navigation expands a list of related links, however the control does not perform any action when activated with the keyboard by pressing Enter or Space.
- When a user is logged in, the "Hello, <User's First Name>" disclosure control in the main navigation, cannot be reached at all by keyboard users, meaning that the "Profile", "Order History" and "Log out" links are completely inaccessible.
- Insufficient color contrast has been identified for many text elements, and this will impact users with low vision, cognitive differences or reading disabilities. For example, the green (#84BB52) and white (#FFFFFF) color pair is commonly used for buttons and links and has a low contrast ratio of 2.28:1. Other problematic color combinations are:
    - Grey text on grey or white background; and
    - White text on orange background.
- The cookies banner cannot be dismissed using the keyboard and must be encountered on each page since the custom "Accept All Cookies" button does not respond to keyboard activation with Enter or Space. There is also no "Skip to main content" present and users must tab trough the cookie prompt and the repeated header controls on each page in the checkout flow, in order to reach the main content.
- The semantic mark-up of headings and landmarks is not an actual representation of the visual structure with many problems including the following:
    - The main content is not encompassed by the <main> and is not part of any landmark.
    - The <main> element incorrectly wraps the header, main navigation, and search feature;
    - Most heading levels are incorrect; and
    - Many text elements that do not serve as section titles clutter the heading structure, for example there are 31 level 6 headings in the footer.
- The hero carousel on the home page auto-rotates on page load with no mechanism available to pause or stop the movement. This can trigger unwanted reactions for folks with vestibular conditions and can be a significant distraction for those with cognitive differences.

Fails

- 1.1.1 Non-text Content (level A)

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- 1.3.1 Info and Relationships (level A)
- 2.1.1 Keyboard (level A)
- 2.2.2 Pause, Stop, Hide (level A)
- 2.4.1 Bypass Blocks (level A)
- 2.4.3 Focus Order (level A)
- 4.1.1 Parsing (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

The ANSI Webstore shows high severity issues that impact users of assistive technology. The most severely affected are:

- Keyboard-only users who cannot go past the "Billing address" step where it is impossible to check the "Accept End User License Agreement" checkbox;
- Screen reader users who cannot determine the purpose of most of the focused elements, including links, buttons, and form controls; and
- Sighted users with cognitive differences that will have trouble determining the purpose of each field where a persistent visible label is not provided.

American Petroleum Institute
URL: https://publications.api.org/

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "American Petroleum Institute" logo link to open https://publications.api.org/
4. Create an account
5. Log in
6. Open any read-only document and access its content
7. Purchase a document on the API Publications Store site.

Inaccessible CAPTCHA Test
Severity: 1

The "Create an Account" form contains a required CAPTCHA test, that is based on the users' ability to perceive a set of letters in an image of text. This test constitutes a significant blocker for someone that cannot rely on sight, for several reasons:

- There is no alternative for the visual test that would be based on a different perception modality.
- The test image is missing an alt attribute to convey the purpose of the image, meaning that some screen readers will ignore the image completely while others will announce the source file name, which is not relevant either.
- The input field is missing an accessible name to convey its purpose and what information needs to be entered in this field.

Fails

- 1.1.1 Non-text Content (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact
It is impossible for a blind screen reader user to figure out the letters in the image and pass the test. Such users cannot create an account with API since the CAPTCHA test is required to submit the form. Without an account, a blind user cannot access any of the API standards.

Missing Visible and/or Programmatic Labels for Input Fields
Severity: 1

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The fields in the "Create an Account" form do not have persistent visible labels. Placeholder text is used in all input fields which is problematic for several reasons:

- It is displayed with insufficient color contrast;
- It disappears once a value is entered; and
- It is inconsistently supported by screen readers.

In the case of the "Country" single-select, there is no visible or programmatic label, and the field relies only on its default value, which is "Select".

In the "Log in" form, the "Email" field lacks an association with its visible label meaning that the placeholder text, "jane.doe@example.com" is the only indication of the input purpose for blind screen reader users. The format sample, as "jane.doe@example.com" makes sense only when heard within the context of an Email field.

Fails

- 1.3.1 Info and Relationships (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

When form fields do not have persistent labels:

- sighted users cannot review the form, since once a value is entered in each field, they all look the same and users cannot determine if the correct information was typed into the correct field unless they delete the entry to see the placeholder.
- folks with low vision may not be able to read the placeholder text at all to determine what needs to be typed into each field.
- blind screen reader users may hear the fields announced without any indication of the fields purpose. Note that most screen readers use a "Forms" mode when a field is reached so that data is typed in, and text that is interposed between form elements will be missed if not associated with the corresponding field.

Finally, when the purpose of a field is unclear, the chances to submit the form with incorrect information are higher, meaning increased time and effort is needed for such simple tasks.

Missing Programmatic Indication of State for "Read-Online Documents" Control

Severity: 1

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In the main navigation bar of the "API | Training" page the "Read-Online Documents" control is followed by a downwards-pointing chevron icon to visually indicate that this is a disclosure control used to expand and collapse a menu with links to various documents. The same information is not available in an accessible manner to indicate the control's functionality and its current state.

Fails

4.1.2 Name, Role, Value (level A)

User Impact

Blind screen reader users are unable to tell from the control's name alone how does it function. Since it is announced as a link, users would expect to reach a new page upon activation. This is not the case, since "Read-Online Documents" acts as a disclosure button. When activated there is no speech output to indicate what happened, and users cannot tell if the control is working or not, or whether additional content is revealed or hidden.

Inaccessible PDF Viewer for Read-Only Documents

Severity: 1

The "HTML5 e-Publication" reading room poses critical and high severity level accessibility issues that affect many user groups.

- Most interactive elements including the page navigation controls or the "Buy Now" link, cannot be reached when pressing Tab or Shift+Tab. There is one white square about 1 mm x 1 mm in size that can be focused with an unclear purpose. In some cases, typing a numeric value and pressing Enter or Space will flip the document pages, other times it will trap the keyboard focus or cause it to be lost.
- Keyboard-only users may be able to see the controls but cannot interact with them or their associated content.
- The page titles are ambiguous, for example "2A-WSD_e21wE3S3-PubAcc".
- The standards documentation pages are images with no textual alternative which means that screen reader users are fully blocked from accessing the read-only version.
- Many actionable elements are announced without a descriptive name or actionable role. This will make most of the functionality inaccessible to screen reader users, as they will not be able to determine control purpose without an appropriate accessible name being provided. Some examples include:
    - The "Buy Now!" link implemented as an image of text and announced as "logo";
    - Custom buttons that are visually labelled using an icon; and

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- The page navigation controls.

- No accessible feedback mechanism is provided for screen reader users whenever content is dynamically updated, or when a loading animation is visually displayed.
- Elements are encountered in a reading order that is not meaningful and hidden content is reached.

Fails

- 1.1.1 Non-text Content (level A)
- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)
- 1.4.5 Images of Text (level AA)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

- The "read-only" documents are inaccessible for all users with different levels of dexterity that cannot interact with the viewer using a mouse, since actionable elements cannot be reached with a keyboard.
- For blind screen reader users, the viewer is completely unusable since controls either lack an accessible name and role to indicate their purpose or they simply cannot be activated. Additionally, the content in the document pages is not available for folks that cannot rely on sight since they are images of text without any text alternative.
- Since the "Buy Now!" link is inaccessible using a keyboard, many users of assistive tools are blocked from purchasing the documentation as well. This problem is aggravated by the fact that both links to the API Publications Store on the Purchase Standards page, are not functional.

Problematic API Publications Store

Severity: 1

- The site uses an AccessiBe overlay that gets toggled when accessing the site with assistive tools. The "Accessibility Adjustments" dialog is problematic in itself for several reasons, such as:
    - Lack of focus indication on switch components other than a change in font color;

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  - Incorrect focus order when interacting with the "Increase" or "Decrease" buttons;
  - Missing heading mark-up for visual headings;
  - Unlabeled "Language" single-select;
  - Uninformative accessible name for many controls; and
  - Lack of programmatic feedback for screen reader users when changes are made or when a list of search suggestions appear.
- Using some of the AccessiBe adjustments seems to impact the site's usability in a negative way, for example, when the "Keyboard Navigation (Motor)" switch is toggled on:
  - the top navigation links (in <nav> with id="top-nav") styled using white font color become positioned on white background making the links invisible; and
  - the links in the main navigation bar (in <nav> with id="main-nav") are no longer clickable with a mouse.
- For further reading on the user impact of such tools please refer to the Overlay Fact Sheet.
- Whenever a modal interface appears the keyboard focus is not managed correctly, for example:
  - The content of the dialog with the title of "This Item Is Already In Your Cart" can only be reached after pressing Tab through all elements of the page.
  - When adding an item to cart the focus is trapped between the controls in the "Upgrade this item" section and cannot dismiss the dialog to return to the product page.
- The keyboard focus becomes lost often after performing an action such as removing an item from cart or closing a dialog.
- The "Payment Method" pill-shaped options are implemented as list items without an interactive role. They cannot be focused with a keyboard unless the AccessiBe "Keyboard Navigation (Motor)" switch is toggled On.
- In a similar way, without the overlay, many controls lack a focus indicator on all pages, making it impossible for sighted keyboard-only users to track the focused element.
- Visual headings are not semantically marked up to allow screen reader users to understand the page structure and find content.
- When reaching the standards page in the bookstore, a data table is used to visually indicate available formats with details and an "Add to cart" button. This visual representation is not programmatic, meaning that screen reader users will not hear the information in the table in a meaningful order and with the column

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header context. It is also difficult to determine which format is added to cart since all buttons have the same accessible names as "Add to cart".

- Tooltips with additional information, such as "What's a Multi-User PDF?" cannot be accessed using a keyboard.
- The "Language" single select in the "Cart Summary" is unlabeled and causes the focus to be lost as soon as its value is changed.
- Additional form controls are either missing an accessible name, such as the "Coupon Code" field, or are not associated correctly with their visible labels, such as the "Shipping Method" radio buttons.
- A notification is displayed at the top of the product detail page when an item is added to card, however it is quickly removed from the page not allowing users to read its content.
- "Successful submission!" is announced whenever a form is submitted regardless of the actual outcome, while errors that appear in the form are not surfaced in an accessible way for screen reader users. This problem might be related to the AccessiBe overlay. Additionally, inline errors are not associated with the corresponding fields.
- The checkout steps rely on color identification to indicate incomplete steps which is problematic for folks with color blindness, low vision, or blind screen reader users.
- Information listed in a data table, e.g. the "Shipping & Handling" rate schedule, is not programmatically implemented using table semantics, meaning data will be communicated without context for screen reader users and will be hard to understand.
- Insufficient color contrast has been identified for many text elements, and this will impact users with low vision, cognitive differences or reading disabilities. The color pairs that have the lowest color contrast ratio are:
    - Orange and white;
    - Blue and white;
    - Grey and white; and
    - Red and grey.
- Instances of elements with the same value for their "id" attribute were found, such as with id="shipping_address_38649320", which can lead to errors when using the site with assistive tools.

Note that industry standards and technical books from publishers other than API are also hosted using the same Techstreet platform hosting from many organizations. Refer to Problematic ASHRAE Bookstore Site.

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Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.4.1 Use of Color (level A)
- 1.4.3 Contrast (Minimum) (level AA)
- 2.1.1 Keyboard (level A)
- 2.1.2 No Keyboard Trap (level A)
- 2.2.1 Timing Adjustable (level A)
- 2.4.3 Focus Order (level A)
- 2.4.6 Headings and Labels (level AA)
- 3.2.2 On Input (level A)
- 4.1.1 Parsing (level A)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

- Some features can only be accessed with a keyboard when using the AccessiBe mode for keyboard navigation, which is an unfair requirement, since as mentioned the overlay adjustments come with significant disadvantages.
- Additionally, the incorrect focus management and instances of focus trap can be quite problematic for sighted keyboard users, who expect the focus indicator to follow the visual order of elements on the screen. Such users will experience frustration and significant increase in effort to go through the checkout steps.
- Blind screen reader users will be prevented from successfully submitting the many forms encountered during checkout, since some fields announce without a label and the presence of error messages is not communicated.

REV-18
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ASTM reading room
URL: https://www.astm.org/products-services/reading-room.html

Steps

1. Go to the ASTM home page at https://www.astm.org/
2. Go to the "Sign in" menu button
3. Create an account
4. Log in
5. Expand "Products & Services" in the navigation bar
6. Select "Reading Room"
7. Select "Open Reading Room"
8. Review "ASTM License Agreement" and proceed with "Agree and Continue"
9. Open any read-only document and access its content

Lack of Focus Indicator in Reading Room on Document Links
Severity: 1

When users press Tab or Shift+Tab through the links in the "All ASTM Content", or the "COVID-19 Related Standards" accordion panels there is no visual cue to indicate which link is focused. The default focus outline is removed using the styling of "outline: 0", without the provision of a custom focus indicator.

Fails
2.4.7 Focus Visible (level AA)

User Impact
Users with different levels of dexterity that interact with the site using a keyboard cannot determine the focused document link and they will unintendedly interact with the wrong element. This is especially impactful in the case of the "All ASTM Content" links which are grouped in a list with 1462 items and visually tracking the links with each Tab press is close to impossible.

Problematic Modal Dialogs
Severity: 1

- Whenever a modal interface appears, such as the "Sign in to access Reading Room" or the "ASTM License Agreement" dialogs, the keyboard focus is not managed correctly, and is no longer visible.

- The ASTM License Agreement cannot be scrolled using a keyboard which is problematic for folks that have different levels of dexterity and cannot use a mouse.
- Visual headings in the ASTM License Agreement are not semantically marked up or have an incorrect heading level making it difficult for screen reader users to understand the overlay structure and find content.

Fails

- 1.3.1 Info and Relationships (level A)
- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)

User Impact

Keyboard-only users have no option to scroll the ASTM License Agreement and must either proceed without reading it or abandon the process. If such users agree with the terms, they become legally obligated to respect terms that they are unable to reach.

Incorrect Semantic Mark-Up

Severity: 1

The reading room pages are visually structured into distinct sections that serve a specific purpose. Some regions are not marked up in a programmatic way, such as the footer so that the same information can be conveyed to blind screen reader users. In other cases, a group of side navigation links are incorrectly marked up as a "tablist" without required parent-child roles. Additionally, while some visual headings are provided, the heading structure is inaccurate due to incorrect heading levels as observed for the "COVID-19 Related Standards" accordion buttons.

Fails

- 1.3.1 Info and Relationships (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Without sight, screen reader users cannot determine how content is structured on a page. Additionally, without the appropriate semantic mark-up for headings and regions, users cannot effectively skip to a specific section. Instead, they must explore the page in a linear manner and try to determine the relations between elements, which are visually obvious. This increases the cognitive load for using the site and the time spend to reach the intended documentation.

Inaccessible Content Viewer
Severity: 1

The ASTM standards open in an iframe with title="webviewer" which comes with critical blockers for many user groups.

- The document content is implemented using a <canvas> with no textual alternative.
- Some documents contain links, which allow keyboard-only users to scroll the content in the viewer, however some standards do not contain any focusable elements and cannot be scrolled at all without the ability to operate a mouse.
- The document links can be reached using the keyboard, however they cannot be activated.
- Since links are implemented as non-semantic elements with class="link" and tabindex="0", they are missing a programmatic name and role to indicate their purpose.
- When pressing Tab or Shift+Tab hidden controls receive focus, meaning that the focus indicator is no longer visible.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.2 Meaningful Sequence (level A)
- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Blind screen reader users cannot access any of the document content. None of the text that is seen in the viewer is spoken by the screen reader. Links announce either as "blank" or with the name of the previous toolbar control, e.g. "clockwise". This format of presenting the standards is completely unusable for someone that cannot rely on sight.

Sighted users with different levels of dexterity that cannot operate a mouse, and rely on a keyboard, are also preventer from accessing the document features:

- If links are present, users can scroll and read the document, but cannot interact with its links and reach the store product detail pages to add the product or service to cart.

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- If links are not present, users must zoom out to fit the entire page content into the browser viewport, which will render the text either difficult to read or simply unreadable.

ASHRAE (heating and air conditioning association)
URL: https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "ASHRAE" logo link to go to the Preview ASHRAE Standards and Guidelines page
4. Open any read-only document and access its content
5. Purchase a document on the AHRAE Bookstore site.

Note that not all document links open the document in the iWrapper powered viewer. In some cases, such as the "Standard 185.2-2020 -- Method of Testing Ultraviolet Lamps for Use in HVAC&R Units or Air Ducts to Inactivate Microorganisms on Irradiated Surfaces" the user is taken directly to the product detail page in the AHRAE Bookstore.

Insufficient Color Contrast for Many Links
Severity: 2

On the "Preview ASHRAE Standards and Guidelines" page, many links are displayed with a low color contrast against their background. This is especially challenging when it comes to the standard documentation links which use a light blue color (#00AED8), resulting in a 2.6:1 color contrast ratio against the white background color (#FFFFFF), below the minimum requirement of 4.5:1.

Additionally, when such links appear in a paragraph there is no other visual cue, such as an underline, to help users distinguish them from the surrounding static text.

Fails

- 1.4.1 Use of Color (level A)
- 1.4.3 Contrast (Minimum) (level AA)

User Impact
Site visitors with low vision or color blindness may not be able to see the link text due to the very light font color. This is especially problematic since all document links, which make up for most content of the page, are styled the same way.

Problematic Keyboard Navigation
Severity: 1

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The links in the main navigation have an icon to visually indicate that a submenu with related links is available. These links appear on mouse-hover over the corresponding link. An accessible alternative is not available for users with different levels of dexterity that interact with the fly-out menu using a keyboard or voice commands.

- There is no control provided to reveal the submenu and keyboard-only users cannot focus the icon. When the link is reached, it can be activated to open the corresponding page, not to reveal or hide the submenu.
- When pressing Tab or Shift+Tab through the main navigation section all 192 submenu links are focused although they are not visible.
- There is no "Skip to main content" link in the <header> to allow keyboard-only users to skip the header with the navigation bar and reach the main content.

Fails

- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)

User Impact

Sighted keyboard-only users cannot access the submenus in the main navigation. Since the links are invisible when focused users cannot determine which element is reached or if the focus is trapped somewhere. Additionally, the required effort to go through all links in the navigation bar is significant and considering that there are 192 Tab stops on hidden links, users will become frustrated and might abandon the page altogether.

Inaccessible "Share This" controls

Severity: 2

The links in the "Share This" section have an icon to visually indicate their functionality however they cannot be reached using a keyboard.

Fails

- 2.1.1 Keyboard (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Sighted keyboard-only users cannot access the links and share a resource.

Incorrect Heading Structure

Severity: 1

REV-24
PAC Sina@SinaBahram.com

While some visual headings are provided, the heading structure is either incomplete or inaccurate due to some incorrect heading levels.

Fails
1.3.1 Info and Relationships (level A)

User Impact
Without sight, screen reader users cannot determine how content is structured on a page. Additionally, without the appropriate semantic mark-up for headings and regions, users cannot effectively skip to a specific section. Instead, they must explore the page in a linear manner and try to determine the relations between elements, which are visually obvious. This increases the cognitive load for using the site and the time spend to reach the intended documentation.

Inaccessible Content Viewer
Severity: 1

The ASHRAE standards open using a document viewer powered by iWrapper which is completely inaccessible for many user groups.

- When pressing Tab to the first interactive element on the page, the "ASHRAE" logo link, the keyboard focus is trapped, and does not move forward to any elements on the page. In fact, all focusable elements trap forward focus and the user must press Shift+Tab to move backwards to the browser controls and return to some of the viewer elements. If at any point, the Tab key is pressed focus becomes trapped.
- Additionally, there are only six controls included in the focus order, while the remaining ones cannot be reached at all with the keyboard. There is no focus indicator on these buttons or links and users cannot determine the focused element.
- The document container is not keyboard focusable and cannot be scrolled to view its content. The document cannot be printed either.
- Since the page input shows the default caret or value highlight on focus the user may attempt to type in a different page number, however only the top of the page is visible, since the viewer content cannot be scrolled. The combobox with zoom level options and preset display preferences is set by default to "Fit Width" and it cannot be expanded using a keyboard. If the user is able to guess that it accepts percentage values such as "60%" and types in a value, the document page becomes fully visible in the viewer, but text is so small that it cannot be read. The zoom buttons cannot be reached with the keyboard. This means that even if other pages can be loaded their content cannot be read.

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- Using a screen reader, the viewer controls are all unlabeled and announce only as "link" or "edit" (for the page and zoom level input fields) or with no role at all as "clickable or "blank". There is also no text alternative for the content of each page.

Fails

- 1.1.1 Non-text Content (level A)
- 2.1.1 Keyboard (level A)
- 2.1.2 No Keyboard Trap (level A)
- 2.4.3 Focus Order (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

The document content is completely inaccessible for anyone that cannot see or cannot use a mouse.

- Sighted keyboard-only users can find workarounds to read the top of any page, but everything else cannot be reached.
- Blind screen reader users cannot access any of the document content.
- Speech input users cannot scroll the document either and will find it extremely difficult to interact with the viewer controls.

Problematic Errata PDF Documents

Severity: 1

There are several accessibility issues that relate to the "view-only" Standards Errata PDFs:

- Documents are not tagged to ensure that appropriate semantic mark-up is used, and that content is accessed in a meaningful reading order.
- The document language or title are not set.
- Mathematical equations do not make sense when reached with a screen reader.
- Tables and lists are not marked up correctly.
- Incorrect nesting is flagged for many elements.
- Visual headings are not implemented as semantic headings, while text in paragraphs is conveyed incorrectly as a heading.
- Significant areas are styled differently to convey that they have been added as new content or changed, but background color changes, text underline or strikethrough are not conveyed to screen reader users. Additionally, text that is crossed out is read as part of the paragraph altering its intended meaning.

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Instructions that explain the meaning of such styling rely on the user's ability to see these format updates:

- "The shaded items have been added since the previous errata sheet"; and
- " Additions are shown in underline and deletions in strikethrough.".

Fails

- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 1.3.3 Sensory Characteristics (level A)
- 2.4.2 Page Titled (level A)
- 3.1.1 Language of Page (level A)
- 4.1.1 Parsing (level A)

User Impact

When a document is reviewed using a screen reader, it can be difficult or impossible to understand the information in the PDFs, such as what content is added or changed or mathematical formulas.

The incorrect heading mark-up is very confusing, since blind screen reader users rely on headings to get an overview of what is in the document and find a specific area of interest.

Problematic ASHRAE Bookstore Site

Severity: 1

Note that some standards lead directly to the bookstore site, e.g. "Standard 185.2-2020 -- Method of Testing Ultraviolet Lamps for Use in HVAC&R Units or Air Ducts to Inactivate Microorganisms on Irradiated Surfaces" and require payment in order to access the documentation.

Since the bookstore is developed using the same Techstreet platform, many problems are shared with the one for the American Petroleum Institute, listed in Problematic API Publications Store. The same AccessiBe overlay is present on the site with similar problems, with the note that in the "Keyboard Navigation (Motor)" mode the global search feature (with class="search") is removed from the page. Additionally, the focus outline is still missing from the main navigation links.

Here are some additional observations that are specific to the ASHRAE Bookstore site, or that have been noted while assessing it without the AccessiBe overlay:

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- Whenever an item is added to cart a modal dialog appears with many accessibility problems:
    - It traps the keyboard focus on its container and although users can see controls in the dialog, such as "View Cart and Checkout" button, they cannot reach them when pressing Tab.
    - If an "Upgrade item" section is present, the Tab focus is trapped within the three elements. The tooltip with instructions is completely inaccessible which can be triggered only on mouse hover.
    - For screen reader users the combobox with upgrade options is not labeled.
    - The overlay does not convey to screen reader users that this is a modal dialog.
    - The Close ("x") button that dismisses the dialog is implemented as a non-semantic element meaning it is not accessible to screen reader users.
    - The Escape key works to dismiss the modal dialog, however it results in the keyboard focus being lost.
- In the checkout flow many required form controls are missing a focus indicator or one that is difficult to see is used.
- The required "Payment Method" pill-shaped options are implemented as list items without an interactive role. They cannot be focused with a keyboard at all.
- Insufficient color contrast has been identified for many text elements, and this will impact users with low vision, cognitive or reading differences. Some examples are:
    - White header link text on light green;
    - Light green text on white background;
    - White button text on orange background;
    - Orange text on white background;
    - Grey text on grey background;
    - White text on blue background; and
    - Blue text on white or grey background.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.4.1 Use of Color (level A)
- 1.4.3 Contrast (Minimum) (level AA)
- 2.1.1 Keyboard (level A)
- 2.1.2 No Keyboard Trap (level A)

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- 2.2.1 Timing Adjustable (level A)
- 2.4.3 Focus Order (level A)
- 2.4.6 Headings and Labels (level AA)
- 3.2.2 On Input (level A)
- 4.1.1 Parsing (level A)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Some features can only be accessed with a keyboard when using the AccessiBe mode for keyboard navigation, which is an unfair requirement, since as mentioned the overlay adjustments come with significant disadvantages.

- Sighted users that cannot operate a mouse and interact with the pages using a keyboard cannot complete the checkout flow and purchase the standards.
- Some workarounds for the keyboard blockers exist when using a screen reader, however for users who are blind it is very difficult to understand their current context in any given step of the checkout.

AHRI Reading Room
URL: https://www.ahrinet.org/standards/-hid-ahri-standards/hvacr-industry-standards/ahri-ari-standards-referenced-in-us

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "AHRI" logo link to go to the AHRI (ARI) Standards Referenced in US Regulations page
4. Open any read-only document and access its content
5. Open the Standards page
6. Open the Published AHRI Standards and Guides page to search for a standard

Insufficient Color Contrast for Many Controls
Severity: 2

On the AHRI website, there are several color themes that make text and icons appear with an insufficient color contrast against their background, below the minimum requirement of 4.5:1 for normal sized text and 3:1 for actionable graphical content. Here are some examples:

Elements	Page	Color	Background	Color Contrast Ratio
Standards links on focus and hover (in with class="html-module")	AHRI (ARI) Standards Referenced in US Regulations	#E87500	#FFFFFF	3.01:1
Expanded standards, guides, and resources	Published AHRI Standards and Guides	#E87500	#FFFFFF	3.01:1
Many links	Footer	#A1B8CB	#466F94	2.58:1
Links in "AHRI on Twitter"	Footer	#2B7BB9	#466F94	1.17:1
Icons in "AHRI on Twitter"	Footer	#667580	#466F94	1.12:1

Fails

- 1.4.3 Contrast (Minimum) (level AA)

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- 1.4.11 Non-text Contrast (level AA)

User Impact

Site visitors with low vision will most likely not be able to read such text or see that some controls even exist.

Problematic Keyboard Navigation

Severity: 1

The default keyboard focus outline is removed using the styling of "outline: none;" and a custom indicator is not supplied. This affects:

- All header elements;
- All links in the main navigation;
- All main content links and tabs; and
- All footer content.

For some links in paragraphs or the standards links, the font color is updated on focus from blue (#466F94) to orange (#E87500), however this indication of focused element relies on color only which cannot be perceived by users with some types of color blindness. Additionally, the orange text is difficult to read due to an insufficient color contrast against the white background. Note that this visual cue is only present on some pages and the standards links to downloadable PDFs on the "Published AHRI Standards and Guides" have no focus indicator whatsoever.

The main navigation menu contains several links, each with an associated submenu that can only be made visible on mouse hover. An accessible alternative is not available for users with different levels of dexterity that interact with the fly-out menu using a keyboard or voice commands.

- There is no control provided to reveal the submenu and when the link is reached, it can be activated to open the corresponding page, not to reveal or hide the submenu.
- When pressing Tab or Shift+Tab through the main navigation section all submenu links are focused although they are not visible.

Fails

- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)
- 2.4.7 Focus Visible (level AA)

User Impact

Sighted keyboard-only users can press Tab or Shift+Tab but cannot determine which element is focused so that they know when to interact with a specific control. Additionally, the fly-out menu links are also invisible on focus. Without the use of a mouse which is an impossibility for some, such folks cannot interact with the site, find the intended standard, and review it.

Since the links are invisible when focused users cannot determine which element is reached or if the focus is trapped somewhere. Additionally, the required effort to go through all links in the navigation bar is significant and considering that there are 192 Tab stops on hidden links, users will become frustrated and might abandon the page altogether.

Missing Text Alternative for Linked Icons

Severity: 1

Many links that contain only an image or an icon lack any discernable text, meaning that the link purpose cannot be conveyed to screen reader users. Affected links are:

- The logo links in the header and footer;
- The social media links in the header; and
- The "Search AHRI Certified" and "AHRI Connect" links in the header.

Fails

- 1.1.1 Non-text Content (level A)
- 2.4.4 Link Purpose (In Context) (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

When blind screen reader users reach those links, they will hear either part of the URL for link's target which is irrelevant or an unlabeled control. For example, both JAWS and NVDA read the Instagram, Twitter, and Facebook links as "ahriconnect" while "Search AHRI Certified" and "AHRI Connect" have no label announced at all, and users only hear it as "link". Folks that cannot rely on sight cannot determine what are these controls intended to do.

Missing Structural Semantic Mark-Up

Severity: 1

The pages are visually structured into distinct sections that serve a specific purpose, such as the page header, site navigation, main content, and footer. These regions are not marked up in a programmatic way, so that the same information can be conveyed to

blind screen reader users. While some visual headings are provided, the heading structure is inaccurate due to incorrect heading levels and missing programmatic implementation of visually styled section titles.

The lack of page semantic mark-up also affects the user's ability to skip past repeated blocks of content in the header. There is no "Skip to main content" link in the <header> to allow keyboard users to skip the header with the navigation bar and reach the main content.

Fails

- 1.3.1 Info and Relationships (level A)
- 2.4.1 Bypass Blocks (level A)

User Impact

Blind screen reader users cannot determine how content is structured on the page and determine useful context within each section that is visually evident. Additionally, without a "Skip to main content" link and the appropriate semantic mark-up for headings and regions, users cannot effectively skip to a specific section. Instead, they must explore the page in a linear manner which is time consuming and frustrating.

Problematic Access to Published AHRI Standards and Guides

Severity: 1

The search feature has several implementation problems that affect users of assistive technologies:

- The search field is missing a programmatic name and relies on its placeholder which is inconsistently supported by screen readers.
- When a search is performed there is no feedback to inform screen reader users about the outcome.
- The standards and guides are grouped in a tablist although visually they resemble an accordion structure:
    - The tab role is applied on the <h6> tag which means that the heading mark-up is overridden; and
    - Tabs have a duplicated state as selected/unselected and expanded/collapsed which has a confusing effect on screen reader users.
- The "Standards Resources" are also using tab mark-up with additional problems:
    - Each resource appears as a disclosure control that reveals or hides the link to the resource PDF document.
    - They are implemented as individual tablists that contain a single tab wrapping the visible name of the control. Both the tablist and the tab

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have a tabindex="0" and the incorrect nesting of elements makes the controls completely inaccessible with some screen reader and browser combinations.
    - The state of the disclosure controls is not conveyed.
    - Since resources are not grouped in any way, screen reader users cannot determine that the disclosures are related and how many there are in the collection.

Fails

- 1.3.1 Info and Relationships (level A)
- 4.1.1 Parsing (level A)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Blind screen reader users can be prevented or will experience increased difficulty in searching for a specific standard or guide or resource.

Problematic PDF Documents

Severity: 1

There are several accessibility issues that relate to the standards PDFs:

- Content is tagged incorrectly resulting in many nesting problems for semantic content. This means that screen reader users will not hear elements announced within the context that is visually intended, and the reading order will not be meaningful.
- The document language is not set.
- The title of the document is either missing or it is irrelevant, for example the " BTS-2000 Testing Standard" has a title of "i".
- Text alternatives are not provided for images, diagrams, charts, or graphs meaning they are completely inaccessible for blind screen reader users.
- Mathematical equations do not make sense when reached with a screen reader.
- Row and column headers are not marked up as such meaning that content in data tables is conveyed without reference to the visual headers.
- Visual headings are not implemented as semantic headings, while random text in paragraphs, tables or mathematical formulas are implemented as level 2 headings. It is impossible to rely on headings to determine the document structure or to find content.

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- Some bookmarks are provided, for example "2023 (2020) Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment" has 141 pages and five bookmarks, mainly for the first pages, which make for an incomplete outline of the main sections in the PDF.
- Some documents such as "AHRI Standard 210/240 with Addendum 1" contain instructions that strictly rely on the user's ability to see specific styling of text, such as "Addendum deletions are shown with strikethrough and addendum additions are shown by shading in gray." Which are not conveyed to blind screen reader users.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 1.3.3 Sensory Characteristics (level A)
- 2.4.1 Bypass Blocks (level A)
- 2.4.2 Page Titled (level A)
- 3.1.1 Language of Page (level A)
- 4.1.1 Parsing (level A)

User Impact

When a document is reviewed using a screen reader, it can be difficult or impossible to understand some of the information in the PDFs. The lack of semantic mark-up is especially problematic when it comes to finding content in large documents such as " 2023 (2020) Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment" containing 141 pages.

AISC Reading Room
URL: https://www.aisc.org/publications/

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "AISC" logo link to go to the AISC Publications page
4. Select to log in
5. Create an account on the Registration page
6. Return to the AISC Publications page
7. Open a free publication

Poor Keyboard Focus Visibility
Severity: 2

When users press Tab or Shift+Tab through the header the default outline is removed via "outline: none". The custom focus indicator relies on background color changes that are difficult or impossible to detect for some. Examples include:

- The top bar links have an off-white (#FAFAFA) background which updates to white (#FFFFFF) meaning that the resulting color contrast for the focus indicator is extremely low, at 1.04:1; and
- The main navigation links use a linear gradient background with varied shades of off-white and grey, depending on the hero image content. A sample color in the vicinity of the "Publications link is #EDEFF0 which has a color contrast ratio of 1.15:1 with the white (#FFFFFF) background color on keyboard focus.

In other instances, there is no focus indicator whatsoever, as noted in the case of the social media links in the footer or the logo link in the header.

Fails

- 2.4.7 Focus Visible (level AA)
- 1.4.11 Non-text Contrast (level AA)

User Impact
Sighted keyboard-only users will have difficulty tracking the focused element and will most likely end up pressing the wrong links leading to unintended actions. Folks that have low vision will simply not be able to see the focus indicator and determine which control has keyboard focus.

Problematic Structural Semantic Mark-Up
Severity: 1

The page structure is not rendered accurately in a programmatic way so that information and relationships that are visually evident can be made available for users of assistive technologies.

- While landmarks are used, not all content is encompassed in the corresponding region, some areas are missing the appropriate mark-up, and navigational regions lack an accessible name.
- Headings are problematic as well with two level 1 headings on all pages and skipped levels in many instances.

The problematic semantic mark-up also affects the user's ability to skip past repeated blocks of content in the header. Note also that there is no "Skip to main content" link in the <header> to allow keyboard users to easily reach the main content.

Fails

- 1.3.1 Info and Relationships (level A)
- 2.4.1 Bypass Blocks (level A)

User Impact
Blind screen reader users cannot determine how content is structured on the page and determine useful context within each section that is visually evident. Additionally, without a "Skip to main content" link and the appropriate semantic mark-up for headings and regions, users cannot effectively skip to a specific section. Instead, they must explore the page in a linear manner which is time consuming and frustrating.

Inaccessible Header Controls
Severity: 1

Several header controls that use an icon as a visible label, are missing an accessible name to indicate their purpose for screen reader users.

- The dropdown toggle that reveals the "Login" link is announced for screen reader users as "link" without any name or indication of state that it reveals additional content. Note as well that the role of the control is incorrect as well since it acts as a button and does not open a new page.
- The "Search" button is announced as "button" without any name .
- The cart link is announced as "link" with the count numeric value of items added in cart if applicable.

Fails

- 1.1.1 Non-text Content (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

The mentioned header controls are essential to ensure that the user can successfully access the reading room. Note that the AISC standards are free only for members, so creating an account and logging in is required in order to by-pass the payment. Blind screen reader users cannot determine the purpose of these controls. If a user decides to register first as a member before adding items to cart, they will not be able to find the "Login" link.

Incorrect Keyboard Navigation in Login Form

Severity: 1

The input fields in the form use tabindex attributes with positive values which means that they are first encountered on the page when Tab is pressed. This creates a very confusing focus order for keyboard users:

- Elements are no longer reached in an order that is based on the visual layout.
- After the "Password" field in the "Login" form, focus goes to the top bar links in the header, and users must tab again to the main content to reach the "Remember me" checkbox and the "Login" button.
- The issue is aggravated by the lack or low visibility of the focus indicator on most actionable elements.

Fails

2.4.3 Focus Order (level A)

User Impact

Keyboard users such as those who are sighted and have different levels of dexterity or folks who are blind and rely on a screen reader, will encounter form elements in an order that is confusing and illogical. This can prevent them from submitting the form successfully and being able to access the free version of the standards.

Inaccessible Error Handling

Severity: 1

When the "Login" or "Registration" form is submitted with missing or invalid data, the page is refreshed, and error messages are listed below each field. They are not surfaced in an accessible manner so that screen reader users become aware of their presence.

Error messages are not programmatically associated with the corresponding fields, meaning that when a field is focused there is no indication that its input is invalid, and an error is present.

Fails

- 1.3.1 Info and Relationships (level A)
- 3.3.1 Error Identification (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Users without sight, which rely on a screen reader to fill out the forms will find it extremely difficult to correct any errors, since they must be manually located for each field.

Inaccessible Membership Application Form

Severity: 1

In order to access the AISC reading room, one must either pay for the resource or must become a member, by completing and submitting an application form that is presented as a downloadable PDF document.

The "2020individual_member_app" form has several accessibility problems that can prevent users from a successful application:

- Content is not tagged, and various sections are read in a random order that is not meaningful.
- The form itself is not fillable and there are no actual input fields. For example, the text of the "Mobile" and "Email" labels is read together, as "Mobile Email" with no option to type in the user's information.
- The document language or title are not set.
- Incorrect nesting is flagged for many elements.
- The form is missing any semantic mark-up.

Fails

- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 2.1.1 Keyboard (level A)
- 2.4.2 Page Titled (level A)
- 3.1.1 Language of Page (level A)
- 4.1.1 Parsing (level A)

User Impact

Many users that cannot print the form and write their information manually, will be prevented from filling out the application form and submit it. This includes blind screen reader users, those with different levels of dexterity that interact with the form using a keyboard or voice commands, or site visitors that do not have access to a printer of a PDF editor software.

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SIBR database
URL: https://standards.gov/sibr/query/index.cfm?fuseaction=home.main

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the FAQ page
3. Select the link for the SIBR Database (in the "How can I access more information about the Standards Incorporated By Reference (SIBR) database hosted by NIST" section)
4. Go to the Publications page and use the search feature

Problematic Navigation on NIST Site
Severity: 1

Users of assistive devices encounter several problems as they explore the site, for example:

- A "Skip to main content" link is provided as the first element on the page, however it is not functional and users that rely on keyboard navigation cannot activate it to reach the main content.
- When the "Menu" button in the header is activated, the main navigation controls are revealed in a modal-like container, which is completely inaccessible for screen reader users due to an aria-hidden="true" applied on a parent container (with class="dialog-off-canvas-main-canvas").
- The "Connect with Us" link has a text alternative of "GovDelivery" which does not convey the link purpose to screen reader users. Also, those relying on voice commands will not be able to activate the link using the visible text that precedes the email icon.
- The "Quick Links" visual heading is implemented as an image of text and thus it is not a programmatic heading to allow screen reader users to reach the links when moving through the page by headings. The current implementation is also problematic for users with low vision or reading challenges that rely on text customization since the text in the image does not respond to such adjustments.
- The "Advanced Search" button on the "Publications" page acts as a disclosure control that reveals and hides the related form controls and conveys is state using an aria-expanded attribute, which is correct, and an aria-pressed attribute, which is intended for toggle buttons. This creates confusing announcements for screen reader users that vary across environments leaving users uncertain of the control's functionality.

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- In the "Advanced Search" form, the "NIST Pub Series" is a single-select that is positioned off-screen and removed from the keyboard focus order using a tabindex="-1". A custom control is provided that creates significant accessibility problems:
    - As soon as VoiceOver users on iOS Safari swipe to the field the page reloads and the screen reader focus restarts at the top of the page. The feature is completely unusable on mobile.
    - On desktop browsers, there is no focus outline on the single-select when Tab or Shift+Tab is pressed. Screen reader users hear the field as an unlabeled read-only input field which is incorrect.
    - A similar implementation is used for the "NIST Topic Areas" multi-select control that is announced as an unlabeled text field.

Fails

- 1.4.5 Images of Text (level AA)
- 2.1.1 Keyboard (level A)
- 2.4.6 Headings and Labels (level AA)
- 2.5.3 Label in Name (level A)
- 3.2.1 On Focus (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Blind screen reader users are heavily impacted by the inaccessibility of the main menu and will not be able to reach some of the pages, or they might find them with great difficulty.

APA – The Engineered Wood Association
URL: https://www.apawood.org/publication-search?q=

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "APA" logo link to go to the APA Publication Search - APA – The Engineered Wood Association page
4. Activate the "Sign in" link
5. Select the "Register" link and create a new account
6. Open any document that has a "Free Download" link and access its content

Inaccessible CAPTCHA Test
Severity: 1

The "Create A New Account" form contains a required CAPTCHA test, which is based on the users' ability to perceive a set of letters in an image of text which raises serious accessibility barriers:

- The test image has an alt attribute with an empty value, meaning that screen readers will ignore the image completely. Folks that are blind are completely blocked from registering with APA.
- The image has a granular appearance, with various shades of light grey in each letter, with the darkest one being #999. The background uses white and off-white colors, meaning that the highest color contrast for parts of text with #999 against a #FFF background is 2.85:1 which falls below the required color contrast ratio.
- There is no alternative for the visual test that would be based on a different perception modality.

Fails

- 1.1.1 Non-text Content (level A)
- 1.4.3 Contrast (Minimum) (level AA)

User Impact
It is impossible for a blind screen reader user to figure out the letters in the image and pass the test. Such users cannot create an account with APA since the CAPTCHA test is required to submit the form. Without an account, a blind user cannot access any of the downloadable APA documentation. Users with low vision are similarly affected.

Incorrect Keyboard Navigation in Registration Form
Severity: 1

The input fields in the "Create A New Account" form, each have a tabindex="10" applied which means that they are first encountered on the page when Tab is pressed. This creates a very confusing focus order for keyboard users:

- Elements are no longer reached in an order that is based on the visual layout.
- After the last checkbox in the "User Services" group, the keyboard focus moves to the header, and users must tab again to the main content to reach the CAPTCHA test and the "Create Account" button.

Fails
2.4.3 Focus Order (level A)

User Impact
Keyboard users such as those who are sighted and have different levels of dexterity or folks who are blind and rely on a screen reader, will encounter form elements in an order that is confusing and illogical. The focus order creates the concern that the submit button and the CAPTCHA test might not be focusable at all. This can prevent them from submitting the form successfully.

Missing Programmatic Labels for Several Form Fields
Severity: 1

Several input fields in the "Create A New Account" form lack a programmatic association with their visible label meaning that there is no indication of the input purpose e.g., "Confirm Email" or the fields rely on their default option, e.g. "Profession", "State/Province" and "Country".

Fails

- 1.3.1 Info and Relationships (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact
When blind screen reader users reach the form fields, they are announced only with their role such as a text field or combobox, and the entered value, meaning it is difficult to determine the field purpose. This will increase the chance of encountering errors upon form submission.

Inaccessible On-Hover Content
Severity: 1

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PAC Sina@SinaBahram.com

In several instances, additional content becomes available on mouse hover. The same does not occur on keyboard focus, for example:

- The submenus in the fly-out main navigation;
- The tooltips for various filter options, e.g. "Builder Tips"; and
- Additional description text for card-type links, such as those in with class="thumb".

Fails
2.1.1 Keyboard (level A)

User Impact
Using a mouse can be very difficult or impossible for some folks, meaning that such content available only on hover, is inaccessible for keyboard users or speech input users.

Inaccessible Error Handling
Severity: 1

The "Create A New Account" form does not indicate visually nor programmatically, which fields are required, and which are not. Additionally, some error text is displayed without giving the user the chance to enter a value. For example, when the "Country" is selected there are two error messages: "State/Province is required" and "Zip/Postal Code is required" which is quite confusing, since users may think that filling out those two forms is sufficient regarding the address details or even the registration process. The "City" and other fields are also required.

When the form is submitted with invalid data, error messages are listed inline and at the bottom of the form above the "Create Account" button, however they are not surfaced in an accessible manner so that screen reader users become aware of their presence or updated content when the form is resubmitted. Additionally, error messages are not programmatically associated with the corresponding fields to assist users in correcting the entry.

Fails

- 1.3.1 Info and Relationships (level A)
- 3.3.1 Error Identification (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Both sighted and non-sighted users cannot determine what information is mandatory for the registration process and what is optional and will most likely attempt to submit the form a few times until all errors are cleared. Blind screen reader users must explore the form in a linear manner and manually locate the error messages.

Inaccessible PDF Documents

Severity: 1

There are several accessibility issues that relate to the standards PDFs:

- Content is not tagged resulting in many nesting problems for semantic content. This means that screen reader users will not hear elements announced within the context that is visually intended.
- The reading order is not meaningful especially where content is displayed on two columns or in a data table as noted in the "Q300.pdf" file. Users cannot make sense of the information announced in the screen reader output.
- The document title and language are not set.
- There are many text frames that make content very difficult to read with a screen reader, for example, the many data tables in the "E30.pdf" (Engineered Wood Construction Guide) cannot be accessed at all. From the cover of the document only the "Construction Guide" text can be read with a screen reader.
- All PDFs are secured and some of the settings might affect their readability with assistive technology. For example, in the "E30.pdf" file users cannot read in a linear manner from one page to the next, and instead must manually select a page thumbnail and then go back to the document pane. This creates the impression that the end of a page is the end of the document which is inaccurate.
- Text alternatives are not provided for images meaning they are completely inaccessible for blind screen reader users.
- No bookmarks are found although documents can be quite large, for example the "Engineered Wood Construction Guide" has 102 pages.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 2.4.1 Bypass Blocks (level A)
- 2.4.2 Page Titled (level A)
- 3.1.1 Language of Page (level A)

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- 4.1.1 Parsing (level A)

User Impact

When a document is reviewed using a screen reader, it is difficult or impossible to understand some of the information in the PDFs. The lack of semantic mark-up is especially problematic when it comes to finding content in large documents. Additionally, some PDFs cannot be explored in a linear manner most likely due to the presence of text frames and security settings.

IEEE, the Institute of Electrical and Electronics Engineers
URL: https://ieeexplore.ieee.org/browse/standards/reading-room/page

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "IEEE" logo link to open https://ieeexplore.ieee.org/browse/standards/reading-room/page
4. Select any standard documentation
5. Create an account
6. Open any read-only document and access its content

Inaccessible Links and Buttons in the Reading Room
Severity: 1

Throughout the flow of accessing a document, there are many controls that cannot be reached at all by keyboard-only users. This affects:

- All standards links in the Reading Room; and
- All refinement titles that reveal or hide related filtering options;

In other cases, controls can be focused when pressing Tab or Shift+Tab but they cannot be interacted with, when users press Enter or Space. Examples of such custom controls are:

- The "Skip to main content" link;
- The "Accept & Close" button that dismisses the cookies prompt, meaning that the overlay obscures a significant part of the main content and keyboard-only users cannot see the focused element; and
- The "Create account" link in the "Sign In for Full Text Access" dialog.

Users may attempt to find a workaround, such as performing a search for a keyword. At every step there are new problems that affect the keyboard operability of the site, for example:

- Many controls lack a visible focus indicator, e.g.:
    - Many filter controls, such as slider knobs and switch like controls; and
    - The "Subscribe" link in the "Sign In for Full Text Access" dialog.
- On every page, users must tab through the cookie prompt and the header elements including all navigation links in all submenus since there are no disclosure controls provided for these submenus.
- Each page comes with its own inaccessible controls, e.g.

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- The related "Search Term" buttons in the Advanced Search form;
- The buttons that remove an applied filter on the search results page; and
- The "Purchase" link in the "Sign In for Full Text Access" dialog when reached from the standards pages. This blocks users from adding the PDF to cart and purchase it, which would have been the only alternative to the reading Room.

Fails

- 2.1.1 Keyboard (level A)
- 2.4.1 Bypass Blocks (level A)
- 2.4.3 Focus Order (level A)
- 2.4.7 Focus Visible (level AA)

User Impact

Sighted keyboard-only users cannot reach the standards links when they press Tab or Shift+Tab. This renders the Reading Room completely unusable for folks that rely solely on keyboard input. Such users can see the controls but cannot reach them and interact with them. The option to purchase the PDF is also unavailable. Without the use of a mouse which is an impossibility for some, such folks have to abandon the site defeated.

Problematic Registration Form

Severity: 1

In order to access the Reading Room, one must create an account which may not be available for some due to the many impediments encountered in the flow. Some are mentioned below:

- Input fields have a tabindex attribute with a positive value which means that they are first encountered on the page when Tab is pressed as it is noted in the case of the "Create Account" form. This creates a very confusing focus order for keyboard users. In the case of the "Email verification code" field that appears in a modal dialog, the tabindex="1" makes the form unreachable after exiting the field.
- A reCAPTCHA test that expires in two minutes must be passed in order to submit the form. Due to the component's accessibility issues and the form's problems overall, such a task will be challenging for users of assistive technology.
- No feedback is provided when updates occur, such as the presence of a loading animation, or the addition of a disclaimer text when the user checks the "I have read and accept the IEEE Privacy Policy" checkbox.

- The tooltips with additional instructions for the password format requirements or the security question are inaccessible for keyboard users, while mouse users cannot dismiss them without having to move the mouse pointer neither they can hover over the tooltip text. This affects users with low vision that rely on screen magnification as it limits their ability to scroll and pan the area of the viewport and read the text.
- When content is presented in a modal dialog, the button that dismisses the overlay lacks an accessible name.
- The confirmation dialog has an aria-hidden="true" applied on its container meaning that screen reader users cannot interact with its content at all.
- Screen reader users can only open the links in the Reading room if they explore the page in a linear manner (Inaccessible Links and Buttons in the Reading Room).
- In the "Reading Room" form that collects additional information, form fields are missing a programmatic name together with a persistent label and rely either on the placeholder text or default value which is not an accessible approach (Missing Visible and/or Programmatic Labels for Input Fields).

Fails

- 1.3.1 Info and Relationships (level A)
- 1.4.13 Content on Hover or Focus (level AA)
- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

In addition to the complexity of the registration process, users of assistive technology have to encounter content in an illogical order, or some cannot be reached at all. Blind screen reader users cannot determine the control purpose for several elements which makes submitting the many forms successfully extremely difficult if not impossible.

Inaccessible "IEEE Xplore" Content Viewer

Severity: 1

Users that have created an account can open standards in a read-only content viewer which comes with additional blockers for users of assistive technology.

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- Each page in the document is implemented using a <img> with id="photo" and class="spinner_overlay" and no textual alternative.
- The <title> element is empty, and the page URL is conveyed as the document's title.
- The navigation controls are missing an accessible name to convey their purpose to screen reader users. Additionally, they are displayed with insufficient color contrast and become invisible on mouse hover.
- Many elements are nested against the HTML specifications and multiple instances of duplicate ID values are found.
- The "Feedback" button cannot be activated using the keyboard with or without a screen reader.

Fails

- 1.1.1 Non-text Content (level A)
- 1.4.5 Images of Text (level AA)
- 2.1.1 Keyboard (level A)
- 2.4.2 Page Titled (level A)
- 4.1.1 Parsing (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Blind screen reader users cannot access any of the document content. None of the text that is seen in the viewer is spoken by the screen reader.

Underwriters Laboratories
URL: https://www.ulstandards.com/IBR/logon.aspx

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "Underwriters Laboratories" logo link to open https://www.ulstandards.com/IBR/logon.aspx
4. Create an account
5. Open any read-only document and access its content

Note that steps 4 and 5 have not been evaluated due to the current registration process. A request for an account has been submitted using the "Contact Us" form. The option to contact "Underwriters Laboratories" by phone or fax have not been attempted. It is possible that registered users with myUL Client Portal can log in to the Reading Room, however this was not implied on the sign in form and thus, this flow was not evaluated.

Problematic Registration Process
Severity: 1

When site visitors attempt to reach the reading room, they are required to log in. New users can activate the "New? Register" link however there is no registration form available on the site. Instead, users are instructed to go to the "Contact Us" page and submit a "Support Request". This approach has a poor usability for many users that might not be able or willing to wait 24 hours until the request is processed. It is very unclear how will the user be able to gain access to the reading room.

There are additional accessibility problems that will make the registration attempt even more difficult:

- Pages contain many layout tables that are not marked as such and create an overly verbose speech output for screen reader users when the table semantics are conveyed for each element.
- The "Contact Us" link on the registration page relies on color alone to indicate that its text is actionable. As previously mentioned, only the "Please visit the Contact Us page to register for access." text is present in the main content of the page.
- Additional problems are encountered in the "Contact Us" form:
    - It also relies on color cues to convey information. The instructions "* Fields in red are required " are displayed at the top of the form and field labels of required fields use red (#FF0000) font color while optional fields

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use black (#000000) text. In addition to the fact that the red (#FF0000) color has insufficient color contrast with the white background, it can be difficult or impossible to distinguish by folks with color blindness, or by users with low vision or cognitive challenges that require some form of font customization.

- There is no asterisk next to the labels displayed in red, so the meaning of the asterisk is unclear.
- There is no programmatic mark-up to convey which fields are required either, meaning that blind screen reader users cannot determine what information must be provided to submit the form.
- Input fields are not associated with their visible labels, instead <th> elements are used for the labels that are aligned to the left-side of the page while the corresponding fields are wrapped in a <td>. The table mark-up is not appropriate, and some screen reader users will announce the fields without any label. In the case of the "City", "State/Prov" and "Zip/Code" fields, "City" is the row header for the cell that contains the "City" field, and the "State/Prov" and "Zip/Code" labels and fields. This association is incorrect.
- When the form is submitted with invalid data, and error summary is displayed at the top of the page above the "Telephone" section:
  - Errors are displayed with insufficient color contrast;
  - The focus remains on the "Send" button at the bottom of the form;
  - No feedback is provided for screen reader users that cannot determine the outcome of the submission; and
  - An asterisk is added after each field that has an error message listed in the summary, which conflicts with the form instructions "* Fields in red are required" since other required fields that have been filled, do not show an asterisk.
- There are no inline errors provided, nor there is any association between a field and the error message in the summary.

Fails

- 1.3.1 Info and Relationships (level A)
- 1.4.1 Use of Color (level A)
- 1.4.3 Contrast (Minimum) (level AA)
- 3.3.1 Error Identification (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.3 Status Messages (level AA)

User Impact
Users with color blindness, low vision, or no vision at all will find it difficult or impossible to submit the registration form successfully.

Incorrect Reflow Behavior for Forms
Severity: 2

With a viewport size of 320 × 256 px, the "Sign in" and "Contact us" forms do not reflow correctly. Input fields and related form controls are partially obscured and require horizontal scrolling.

Fails
1.4.10 Reflow (level AA)

User Impact
For people with low vision, enlarged text with reflow enables reading. Enlargement enables perception of characters, while reflow enables tracking or following along lines of text, including getting from the end of one line to the beginning of the next line. The need of scrolling in both directions significantly increases the effort required to read for screen magnification users.

ICC, the International Code Council
URL: https://codes.iccsafe.org/

Steps

1. Go to the ANSI portal at https://ibr.ansi.org/
2. Go to the "Hosted by SDOs" section
3. Activate the "ICC, International Code Council" logo link to open https://codes.iccsafe.org/
4. Search for a document or browse by "Standards"
5. Open any read-only document and access its content
6. Attempt to purchase paid content (note that only the initial steps in the checkout process have been reviewed).

Restricted Zoom by Viewport Scaling
Severity: 1

The currently set viewport values prevent users from resizing the pages (<meta name="viewport" content="width=device-width, initial-scale=1, minimum-scale=1, user-scalable=no">).

Fails
1.4.4 Resize text (level AA)

User Impact
While some browsers might override such settings, others will not, and viewers with low vision that require screen magnification will not be able to adjust the zoom to fit their needs so they can read the text.

Inaccessible "Click to access" Cards
Severity: 1

In many instances, card-like components are used to open the documentation page. They are implemented using an anchor element without a "href" attribute that encompasses a cover image and the name of the documentation in text. A title attribute is applied on the <a> with a value of "Click to access". In the current implementation, keyboard-only users cannot reach the cards at all when pressing Tab or Shift+Tab.

Using a screen reader, the cards can be focused with next item navigation, however there is no programmatic role of a "link" announced and users will not know that the document name is actionable.

Examples can be found in many instances, including:

- in the "Popular Titles" carousel on the "Digital Codes" landing page; and
- on all Category pages, e.g. "Building Codes"; and
- on the Search Results page, when performing a site search for a keyword.

Fails

- 1.3.1 Info and Relationships (level A)
- 2.1.1 Keyboard (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Folks with different levels of dexterity that rely on keyboard interaction will not be able to open such cards found throughout the site. Users can assume from the card-like appearance that they are intended to be links, but they cannot be reached and activated with a keyboard.

Inaccessible Menu Widgets

Severity: 1

On the "Digital Codes" landing page, in the "Browse Available Contents By:" section, there are eight category buttons that expand a collection of "menuitems". Each <button> element contains a down pointing arrow to visually indicate the disclosure functionality. There is no programmatic means to convey the same information for blind screen reader users.

Additionally, once a button is activated, e.g. "Standards", a popup is displayed with related options, each implemented as a link with a "menuitem" role, while the group is encompassed in a with role="menu". Since the implementation is incomplete and there is no programmatic association between the triggering control and the popup, screen reader users cannot interact with the menu items. If Down Arrow is pressed, the keyboard focus does move through the items, but the speech output is silent. If Tab is pressed the popup is dismissed and focus moves to the next control on the page.

Fails

- 1.3.1 Info and Relationships (level A)
- 2.1.1 Keyboard (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

Screen reader users will feel confused about the functionality of the buttons in the "Browse Available Contents By:" section and will most likely conclude that they are broken. This means users must resort to other methods, such as the global search to find content. Note, however that the card-like links for the standards on the "Search Results" page have accessibility problems as well, which are detailed in Inaccessible "Click to access" Cards.

Missing Text Alternative for Images

Severity: 1

Throughout the site, buttons and links that use an icon or an image for a visual label, have no text alternative. This means that screen reader users will hear the controls announced without any name or with part of the image file name. Some examples are:

- Many controls in the header, such as the logo link, "Concurrent Access", ICC Family Solution" buttons and many several controls in the main menu overlay;
- The "Menu" button in the mobile header;
- The "Browse by Category" button;
- The "Add to Favorites" button;
- The button that shows or hides the "Table of Contents" panel; and
- The disclosure controls in the "Table of Contents" panel.

Similarly, images that are not actionable are also missing a text alternative, and only the role of "image" is conveyed for screen reader users.

Fails

- 1.1.1 Non-text Content (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

There are no workarounds available for blind screen reader users to figure out what do the images represent. In cases where they are actionable, users cannot determine what is their functionality. Since there is a significant number of occurrences, many users might just abandon the site after several unintended interactions.

Problematic Content Viewer

Severity: 1

Some standards that are part of the free "Basic" plan, can be reviewed within the site, which is a very useful approach, however there are several accessibility issues noted:

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- The tag buttons that open a dialog, such as "P" (Additional Premium Material) or "ES" (ICC-ES Reports Listing) cannot be reached by keyboard-only users.
- The names of all chapters, parts, sections, and further subsections that are visually styled as headings, are each marked up as a level 1 heading, which should have been reserved for the standard documentation title.
- The document uses changes in font color to convey information, e.g. "Technical code changes from the previous edition of the International Codes are shown in blue text", "National (outside U.S.) and state amendments and errata to International Codes are shown in red text", and "City or local amendments and errata to the International Codes are shown in fuchsia text".

Fails

- 1.3.1 Info and Relationships (level A)
- 1.3.3 Sensory Characteristics (level A)
- 2.1.1 Keyboard (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

The information that is conveyed using styling techniques is not made available for screen reader users that are blind. Keyboard-only users encounter inaccessible controls and cannot interact with the tag buttons.

Inaccessible Controls in "Table of Contents"

Severity: 1

Some standards that are part of the free "Basic" plan, can be reviewed within the site, however, the "Table of Contents" panel intended for navigation to different chapters, parts, sections, and further subsections, has several serious problems that can limit a user's access to different areas of the document:

- The "Table of Contents" lacks any structural mark-up to convey relationships between items that are visually evident.
- Each expandable item contains an icon implemented as a <button> element. Since it has no text alternative, most screen readers announce all these controls as "arrow_right, button" (Missing Text Alternative for Images). The state as expanded or collapsed is also not communicated.
- The name of each item in the "Table of Contents" serves as a link to load that part of the standard. None can be reached by keyboard-only users.
- A context menu is available for each custom link, but only on mouse right-click.

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- The "Legend Information" control is intended to open a modal dialog, however it is inaccessible with the keyboard. Additionally, the triggered overlay is missing the required mark-up and focus management to convey the context of a modal dialog for screen reader users.
- When the control that collapses the panel is activated, keyboard users must still tab through all hidden "Table of Contents" buttons.

Fails

- 1.1.1 Non-text Content (level A)
- 1.3.1 Info and Relationships (level A)
- 1.3.2 Meaningful Sequence (level A)
- 2.1.1 Keyboard (level A)
- 2.4.3 Focus Order (level A)
- 4.1.2 Name, Role, Value (level A)

User Impact

The "Table of Contents" links are fully inaccessible for keyboard-only users and all that is available is expanding or collapsing the nodes in the navigational structure, but users cannot access anything further than the introductory page. Due to the many issues that relate to the mark-up of the "Table of Contents" panel, screen reader users cannot determine the structure of the document and find intended content.

Inaccessible Forms for Premium Plan

Severity: 1

Some documentation is only available if purchased or if the user registers for the Premium plan, which comes with 14-days free trial. Folks that rely on assistive technologies encounter several problems that have the potential of blocking a successful submission:

- The radio buttons in the "Choose a subscription that suits you" group have descriptive visible labels with the payment plan details, but this association is not programmatic, so screen reader users hear them as unlabeled.
- The "Start a 14-day free Digital Codes Premium trial or subscribe now" form has no visible labels for all input fields, which rely on their placeholder value. This impacts both sighted and non-sighted users who cannot determine the input purpose once a value is typed in.
- An example is the "Spam Protection" field which has a math question as placeholder text:

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PAC Sina@SinaBahram.com

    - NVDA users at default punctuation settings hear the text as "What is 5 5?" instead of "What is 5 minus 5?". Placeholder text cannot be read in character mode, so the math question does not make sense.
    - Once the answer is typed in, the field is announced without any label, only as "edit required, selected zero".
- When the form is submitted with missing or invalid data, error messages are displayed at the top of the form while the focus remains on the "Sign up" button. Nothing is communicated for screen reader users. If Tab or Shift+Tab is pressed, the errors disappear from the page.
- Field instructions, such as password requirements are not programmatically associated with the fields.
- The autocomplete attribute is not applied to any of the input fields collecting the user's information.

Fails

- 1.3.1 Info and Relationships (level A)
- 1.3.5 Identify Input Purpose (level AA)
- 3.3.1 Error Identification (level A)
- 3.3.2 Labels or Instructions (level A)
- 4.1.2 Name, Role, Value (level A)
- 4.1.3 Status Messages (level AA)

User Impact

Users without sight, which rely on a screen reader to purchase the documents, or a subscription encounter many unlabeled form controls that do not convey their purpose. Additionally, if errors occur, they are impossible to find in the form. Sighted users are affected as well by the current error handling and lack of persistent labels.

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PAC Sina@SinaBahram.com

Appendix: Failed Success Criteria

1.1.1 Non-text Content (level A)

All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except for the situations listed below.

- Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. (Refer to Success Criterion 4.1.2 for additional requirements for controls and content that accepts user input.)
- Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. (Refer to Guideline 1.2 for additional requirements for media.)
- Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content.
- Sensory: If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content.
- CAPTCHA: If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities.
- Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.

Understanding 1.1.1

1.3.1 Info and Relationships (level A)

Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text.

Understanding 1.3.1

1.3.2 Meaningful Sequence (level A)

When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined.

Understanding 1.3.2

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1.3.3 Sensory Characteristics (level A)

Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, color, size, visual location, orientation, or sound.

Note 1: For requirements related to color, refer to Guideline 1.4.

Understanding 1.3.3

1.3.5 Identify Input Purpose (level AA)

The purpose of each input field collecting information about the user can be programmatically determined when:

- The input field serves a purpose identified in the Input Purposes for User Interface Components section; and
- The content is implemented using technologies with support for identifying the expected meaning for form input data.

Understanding 1.3.5

1.4.1 Use of Color (level A)

Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

Note 1: This success criterion addresses color perception specifically. Other forms of perception are covered in Guideline 1.3 including programmatic access to color and other visual presentation coding.

Understanding 1.4.1

1.4.3 Contrast (Minimum) (level AA)

The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following:

- Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;
- Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.
- Logotypes: Text that is part of a logo or brand name has no contrast requirement.

Understanding 1.4.3

1.4.4 Resize text (level AA)

Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality.

Understanding 1.4.4

1.4.5 Images of Text (level AA)

If the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following:

- Customizable: The image of text can be visually customized to the user's requirements;
- Essential: A particular presentation of text is essential to the information being conveyed.

Note 1: Logotypes (text that is part of a logo or brand name) are considered essential.

Understanding 1.4.5

1.4.10 Reflow (level AA)

Content can be presented without loss of information or functionality, and without requiring scrolling in two dimensions for:

- Vertical scrolling content at a width equivalent to 320 CSS pixels; and
- Horizontal scrolling content at a height equivalent to 256 CSS pixels.

(Except for parts of the content which require two-dimensional layout for usage or meaning.)

Understanding 1.4.10

1.4.11 Non-text Contrast (level AA)

The visual presentation of the following have a contrast ratio of at least 3:1 against adjacent color(s):

- User Interface Components: Visual information required to identify user interface components and states, except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author;
- Graphical Objects: Parts of graphics required to understand the content, except when a particular presentation of graphics is essential to the information being conveyed.

Understanding 1.4.11

1.4.13 Content on Hover or Focus (level AA)

Where receiving and then removing pointer hover or keyboard focus triggers additional content to become visible and then hidden, the following are true:

- Dismissible: A mechanism is available to dismiss the additional content without moving pointer hover or keyboard focus, unless the additional content communicates an input error or does not obscure or replace other content;
- Hoverable: If pointer hover can trigger the additional content, then the pointer can be moved over the additional content without the additional content disappearing;
- Persistent: The additional content remains visible until the hover or focus trigger is removed, the user dismisses it, or its information is no longer valid.

Exception: The visual presentation of the additional content is controlled by the user agent and is not modified by the author.

Understanding 1.4.13

2.1.1 Keyboard (level A)

All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints.

- Note 1: This exception relates to the underlying function, not the input technique. For example, if using handwriting to enter text, the input technique (handwriting) requires path-dependent input, but the underlying function (text input) does not.
- Note 2: This does not forbid and should not discourage providing mouse input or other input methods in addition to keyboard operation.

Understanding 2.1.1

2.1.2 No Keyboard Trap (level A)

If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away.

Note 1: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

Understanding 2.1.2

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PAC Sina@SinaBahram.com

2.2.1 Timing Adjustable (level A)

For each time limit that is set by the content, at least one of the following is true:

- Turn off: The user is allowed to turn off the time limit before encountering it; or
- Adjust: The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or
- Extend: The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or
- Real-time Exception: The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or
- Essential Exception: The time limit is essential and extending it would invalidate the activity; or
- 20 Hour Exception: The time limit is longer than 20 hours.

Understanding 2.2.1

2.2.2 Pause, Stop, Hide (level A)

For moving, blinking, scrolling, or auto-updating information, all of the following are true:

- Moving, blinking, scrolling: For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and
- Auto-updating: For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential.

- Note 1: For requirements related to flickering or flashing content, refer to Guideline 2.3.
- Note 2: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.
- Note 3: Content that is updated periodically by software or that is streamed to the user agent is not required to preserve or present information that is generated or received between the initiation of the pause and resuming presentation, as this may not be technically possible, and in many situations could be misleading to do so.
- Note 4: An animation that occurs as part of a preload phase or similar situation can be considered essential if interaction cannot occur during that phase for all users

and if not indicating progress could confuse users or cause them to think that content was frozen or broken.

Understanding 2.2.2

2.4.1 Bypass Blocks (level A)
A mechanism is available to bypass blocks of content that are repeated on multiple Web pages.

Understanding 2.4.1

2.4.2 Page Titled (level A)
Web pages have titles that describe topic or purpose.

Understanding 2.4.2

2.4.3 Focus Order (level A)
If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.

Understanding 2.4.3

2.4.4 Link Purpose (In Context) (level A)
The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general.

Understanding 2.4.4

2.4.6 Headings and Labels (level AA)
Headings and labels describe topic or purpose.

Understanding 2.4.6

2.4.7 Focus Visible (level AA)
Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible.

Understanding 2.4.7

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PAC Sina@SinaBahram.com

2.5.3 Label in Name (level A)
For user interface components with labels that include text or images of text, the name contains the text that is presented visually.

Understanding 2.5.3

3.1.1 Language of Page (level A)
The default human language of each Web page can be programmatically determined.

Understanding 3.1.1

3.2.1 On Focus (level A)
When any user interface component receives focus, it does not initiate a change of context.

Understanding 3.2.1

3.2.2 On Input (level A)
Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component.

Understanding 3.2.2

3.3.1 Error Identification (level A)
If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text.

Understanding 3.3.1

3.3.2 Labels or Instructions (level A)
Labels or instructions are provided when content requires user input.

Understanding 3.3.2

4.1.1 Parsing (level A)
In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features.

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PAC Sina@SinaBahram.com

Note 1: Start and end tags that are missing a critical character in their formation, such as a closing angle bracket or a mismatched attribute value quotation mark are not complete.

Understanding 4.1.1

4.1.2 Name, Role, Value (level A)

For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.

Note 1: This success criterion is primarily for Web authors who develop or script their own user interface components. For example, standard HTML controls already meet this success criterion when used according to specification.

Understanding 4.1.2

4.1.3 Status Messages (level AA)

In content implemented using markup languages, status messages can be programmatically determined through role or properties such that they can be presented to the user by assistive technologies without receiving focus.

Understanding 4.1.3