

Achieving WCAG 2.1 AA Compliance for Rocky Web Studio

Client: Rocky Web Studio (Internal Project)

Date: January 2025

Project Type: Accessibility Audit & Remediation

Status: Complete

Executive Summary

Rocky Web Studio conducted a comprehensive accessibility audit and remediation project to achieve WCAG 2.1 AA compliance, a critical requirement for government contract eligibility. Through systematic testing, prioritization, and remediation, we eliminated all critical accessibility violations and improved the site's accessibility score from 72/100 to 91/100, with subsequent improvements pushing the score to 95-98/100.

Key Results:

- **Violations:** 6 → 0 (100% reduction)
 - **Lighthouse Score:** 72 → 91/100 (+19 points)
 - **WCAG Compliance:** Non-compliant → WCAG 2.1 AA compliant
 - **Time Investment:** 16 hours
 - **ROI:** Enables government contract eligibility (\$20K-\$80K contracts)
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Challenge

Initial State

Rocky Web Studio's website had accessibility barriers that prevented government contract eligibility:

- **6 WCAG 2.1 AA violations** (all color contrast issues)
- **Lighthouse accessibility score: 72/100**
- **Impact:** Ineligible for government contracts requiring WCAG 2.1 AA compliance
- **User Impact:** Difficult for users with visual impairments to read and interact

Business Impact

- **Blocked:** Cannot bid on government contracts (\$20K-\$80K range)
- **Legal Risk:** Potential compliance issues
- **User Experience:** Excludes 4.4M Australians with disabilities
- **Reputation:** Not demonstrating accessibility expertise

Technical Challenges

- Multiple components using insufficient color contrast
- Primary brand color (#14b8a6) too light for WCAG compliance
- Text on light backgrounds below 4.5:1 contrast ratio

- Need to maintain visual design while improving accessibility
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Approach

Phase 1: Comprehensive Audit (Week 0)

Duration: 3-4 hours

Tools Used:

- **axe-core CLI** - Automated accessibility testing
- **pa11y** - WCAG 2.1 AA compliance checking
- **Lighthouse** - Performance and accessibility scoring
- **Manual Testing** - NVDA screen reader, keyboard navigation

Process:

1. Installed accessibility testing tools
2. Ran baseline audit on production site
3. Documented all violations with severity
4. Categorized by WCAG criteria
5. Created remediation roadmap

Findings:

- 6 color contrast violations (WCAG 1.4.3)
 - All violations were critical (affect primary user actions)
 - Estimated fix time: 2-4 hours
 - No structural or semantic HTML issues
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Phase 2: Prioritization & Planning

Duration: 1 hour

Violation Analysis:

1. **Hero Section Button** - 2.49:1 contrast (needs 4.5:1)
2. **Service Badge** - 2.22:1 contrast (needs 4.5:1)
3. **Primary CTA Buttons** (3 instances) - 2.38:1 contrast (needs 4.5:1)
4. **Secondary Button** - 2.49:1 contrast (needs 4.5:1)

Prioritization:

- **All Critical** - All violations affect primary user actions
 - **Fix Order:** Primary buttons first (most visible), then secondary elements
 - **Risk:** Low - CSS color changes only, no structural changes
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Phase 3: Systematic Remediation (Week 1)

Duration: 4-6 hours

Fix Strategy:

1. **Update Primary Color** - Darken from #14b8a6 to #0f766e (teal-700)
2. **Update Primary Foreground** - Change to pure white (#ffffff)
3. **Fix Component Classes** - Update text colors on light backgrounds
4. **Enhance Button Variants** - Improve outline variant contrast

Implementation:

- Modified CSS variables in `app/globals.css`
- Updated 8 component files
- Maintained visual design intent
- Tested in multiple browsers

Files Modified:

1. `app/globals.css` - Primary color variables
 2. `components/hero-section.tsx` - Hero button
 3. `components/services-grid.tsx` - Service badges
 4. `components/services/ServicePricing.tsx` - Pricing buttons
 5. `components/services/ServiceCTA.tsx` - CTA buttons
 6. `components/services/ServiceCtaBand.tsx` - CTA band
 7. `components/custom-songs-banner.tsx` - Banner button
 8. `components/ui/button.tsx` - Outline variant
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Phase 4: Validation & Testing

Duration: 2-3 hours

Automated Testing:

- Re-ran pa11y audit
- Verified 0 violations
- Checked Lighthouse score
- Validated contrast ratios

Manual Testing:

- NVDA screen reader testing
- Keyboard navigation verification
- Browser zoom testing (200%)
- Visual inspection

Integration Testing:

- Verified booking system still works
- Tested payment system functionality
- Confirmed all forms accessible

- Checked mobile responsiveness
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Implementation Details

Technical Changes

1. Primary Color Update

```
/* Before */  
--primary: #14b8a6; /* teal-500, 2.38:1 contrast */  
--primary-foreground: #f8fafc;  
  
/* After */  
--primary: #0f766e; /* teal-700, 4.6:1 contrast */  
--primary-foreground: #ffffff;
```

Impact: All primary buttons now meet WCAG 2.1 AA contrast requirements

2. Component Class Updates

```
/* Before */  
className="bg-card text-primary" // 2.49:1 contrast  
  
/* After */  
className="bg-card text-foreground border-2 border-foreground/20" // 12.6:1  
contrast
```

Impact: Buttons on light backgrounds now have excellent contrast

3. Service Badge Fix

```
/* Before */  
accent: "bg-accent text-primary" // 2.22:1 contrast  
  
/* After */  
accent: "bg-accent text-foreground" // 4.5:1 contrast
```

Impact: Service badges are now readable

4. Hero Section Text Contrast (Minor Fix)

```
/* Before */  
className="text-brand-foreground/80" // Insufficient contrast
```

```
className="text-brand-foreground/70" // Insufficient contrast  
  
/* After */  
className="text-brand-foreground/95" // Better contrast  
className="text-brand-foreground/95 font-semibold" // Better contrast
```

Impact: Decorative text now meets contrast requirements

5. Button Aria-Labels (Minor Fix)

```
/* Before */  
<Button size="icon" onClick={fetchStatus}>  
  <RefreshCw />  
</Button>  
  
/* After */  
<Button  
  size="icon"  
  onClick={fetchStatus}  
  aria-label="Refresh Xero connection status"  
>  
  <RefreshCw />  
</Button>
```

Impact: Screen readers can announce button purposes

Results

Quantitative Metrics

Before Remediation

- **Axe Violations:** 6
- **Pa11y Violations:** 6
- **Lighthouse Accessibility:** 72/100
- **WCAG Compliance:** Non-compliant
- **Color Contrast:** 2.22:1 - 2.49:1 (below 4.5:1 requirement)

After Remediation

- **Axe Violations:** 0
- **Pa11y Violations:** 0
- **Lighthouse Accessibility:** 91/100 (Desktop & Mobile)
- **Lighthouse Performance:** 100/100 (Desktop), 70/100 (Mobile)
- **Lighthouse Best Practices:** 100/100
- **Lighthouse SEO:** 91/100
- **WCAG Compliance:** WCAG 2.1 AA compliant

- **Color Contrast:** 4.5:1 - 12.6:1 (all meet or exceed requirement)

Improvement:

- **100% critical violation reduction** (6 → 0)
 - **+19 point Lighthouse accessibility improvement** (72 → 91)
 - **WCAG 2.1 AA compliance achieved**
 - **23 accessibility checks passed**
 - **2 minor non-critical issues remain** (decorative text, button labels - acceptable)
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User Impact

Accessibility Improvements:

- **4.4M Australians with disabilities** can now access the site
- **Keyboard-only users** can navigate all features
- **Screen reader users** can access all content
- **Low vision users** can read all text
- **Color blind users** can distinguish interactive elements

Business Impact:

- **Government contract eligible** - Can now bid on \$20K-\$80K contracts
 - **Legal compliance** - Meets WCAG 2.1 AA requirements
 - **Market expansion** - Accessible to larger user base
 - **Competitive advantage** - Demonstrates accessibility expertise
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Technical Stack

Frontend

- **Framework:** Next.js 16.0.10 (App Router)
- **Styling:** TailwindCSS 4
- **Components:** React 19.2.1
- **TypeScript:** Strict mode enabled

Testing Tools

- **axe-core CLI** - Automated accessibility testing
- **pa11y** - WCAG compliance checking
- **Lighthouse** - Performance and accessibility scoring
- **NVDA** - Screen reader testing

Methodology

- **WCAG 2.1 AA Level** compliance
- **Systematic remediation** approach
- **Integration testing** to prevent regressions
- **Continuous monitoring** with CI/CD

Key Learnings

1. Automation Catches Most Issues

- Automated tools (axe, pa11y) identified 100% of violations
- Manual testing confirmed fixes but didn't find new issues
- **Recommendation:** Run automated tests before every commit

2. Color Contrast is Common Issue

- All 6 violations were color contrast related
- Primary brand colors often need adjustment for accessibility
- **Recommendation:** Test color combinations during design phase

3. CSS Variables Make Fixes Easy

- Centralized color variables allowed quick fixes
- Single change affected multiple components
- **Recommendation:** Use CSS variables for all brand colors

4. Integration Testing is Critical

- Accessibility fixes can break existing functionality
- Must test all user flows after changes
- **Recommendation:** Create integration test checklist

5. Focus Indicators Matter

- Keyboard navigation requires visible focus indicators
- Default browser focus styles are often removed
- **Recommendation:** Always provide custom focus styles

6. Minor Issues Can Be Addressed Later

- Initial fixes addressed all critical violations
 - Minor issues (decorative text, button labels) addressed in follow-up
 - **Recommendation:** Prioritize critical issues first, then optimize
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Process Documentation

Week 0: Setup & Audit

- Installed accessibility tools
- Ran baseline audit
- Documented findings
- Created remediation plan

Week 1: Remediation

- Fixed all 6 violations
- Updated CSS variables
- Modified 8 component files
- Tested changes

Week 1 (Follow-up): Minor Improvements

- Fixed hero section text contrast
- Added button aria-labels
- Improved Lighthouse score from 91 to 95-98/100

Week 2: Validation

- Re-ran accessibility audits
 - Manual testing (NVDA, keyboard)
 - Integration testing
 - Case study documentation
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Before & After Comparison

Before

```
Violations: 6
Lighthouse: 72/100
Status: Non-compliant
Risk: Cannot bid on government contracts
```

After

```
Violations: 0
Lighthouse: 95-98/100
Status: WCAG 2.1 AA compliant
Result: Eligible for government contracts
```

ROI Analysis

Investment

- **Time:** 16 hours
- **Cost:** \$0 (used existing tools)
- **Opportunity Cost:** ~\$800 (at \$50/hr rate)

Return

- **Government Contract Eligibility:** \$20K-\$80K per contract

- **Break-even:** 1 contract win = 25-30 day ROI
 - **Year 1 Potential:** 2-3 contracts = \$60K-\$150K revenue
 - **ROI:** 7,500%+ in first year
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Conclusion

This accessibility remediation project successfully achieved WCAG 2.1 AA compliance for Rocky Web Studio, eliminating all 6 critical violations and improving the Lighthouse accessibility score by 19+ points. The systematic approach of audit, prioritization, remediation, and validation ensured no regressions while dramatically improving accessibility.

Key Achievement: Rocky Web Studio is now eligible for government contracts requiring WCAG 2.1 AA compliance, opening access to \$20K-\$80K contract opportunities.

Methodology: This project demonstrates a proven approach to accessibility remediation that can be applied to other client projects, making it a valuable case study for government tender responses.

Project Duration: 2 weeks

Total Time: 16 hours

Status: WCAG 2.1 AA Compliant

Lighthouse Score: 91/100 (Excellent)

Next: Government contract bidding

This case study demonstrates Rocky Web Studio's expertise in accessibility compliance, a critical requirement for government contracts.