Project Horizon: Technical Equipment Specifications Addendum

DOCUMENT TITLE: Equipment Architecture and Vendor-Agnostic Specifications Addendum

PROJECT TITLE: Project Horizon: Scaling Digital Accessibility via Automated Curriculum-as-Code

INSTITUTIONAL HOME: AWC Regional Center for Emerging Technology / Entrepreneurial College

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1. Dedicated Edge Processing Workstation ($3,200)

- **Operational Purpose:** A standalone workstation dedicated to local algorithmic linting, executing offline open-weight model runtimes, and managing high-throughput batch audits of .imscc instructional packages without external server overhead.
- **Vendor-Agnostic Technical Specifications:**
  - **Processor (CPU):** High-core-count multi-threaded processor (minimum 16 performance cores) to handle parallelized file parsing and build-layer linting tasks.
  - **Memory (RAM):** Minimum 64GB high-bandwidth DDR5 RAM to support local loading and execution of quantized open-weight Gemma models in memory.
  - **Graphics Processing Unit (GPU):** Dedicated desktop GPU featuring a minimum of 16GB VRAM (or unified memory architecture equivalent) optimized for high tensor throughput and rapid local inference.
  - **Storage:** 2TB NVMe PCIe 4.0 Solid State Drive (SSD) delivering high read/write speeds for accelerated local package extraction, compilation, and batch logging.
  - **Network Isolation:** Configured entirely for offline, air-gapped operation to ensure zero-trust security and data sovereignty.

2. Dual Calibrated Reference-Grade Monitors ($2,400)

- **Operational Purpose:** Specialized desktop displays connected directly to the edge workstation for empirical luminance mapping, spatial frequency calculations, and precise APCA contrast profiling.
- **Vendor-Agnostic Technical Specifications:**
  - **Display Panel & Resolution:** Dual 27-inch 4K UHD (3840 x 2160) IPS or OLED panels ensuring pixel-accurate typography and reliable spatial frequency evaluation.
  - **Color Accuracy:** Hardware calibration support with 100% sRGB and minimum 99% DCI-P3 / Adobe RGB color space coverage, backed by factory calibration reports.

- **Luminance Control:** High peak brightness and deep black-level contrast ratios designed to simulate varied viewing conditions and map accurate perceptual luminance curves.
- **Ergonomics & Connectivity:** Fully adjustable height, pivot, and tilt stands equipped with DisplayPort 1.4 or HDMI 2.1 inputs.

3. Multi-Tier Mobile Testbed ($1,750)

- **Operational Purpose:** A closed collection of physical test units used strictly for real-world readability validation, responsive layout testing, and typographic scaling under field conditions.
- **Vendor-Agnostic Technical Specifications:**
  - **Android Tier:** Modern budget-tier Android smartphone and mid-range Android tablet to verify font rendering and performance across varied mobile viewports.
  - **iOS Tier:** Legacy iPhone (using smaller screen-factor constraints) alongside a current-generation standard iOS device to test cross-platform CSS compliance.
  - **Endpoint Configuration:** Maintained entirely as isolated test hardware without enterprise endpoint registration or cellular plan dependencies, utilizing local Wi-Fi sandboxes for .imscc package inspection.

4. Hardware Colorimeter & Ambient Light Photometer ($750)

- **Operational Purpose:** Precision scientific instrumentation to measure outdoor ambient lux levels and calibrate mobile display surfaces against empirical glare thresholds.
- **Vendor-Agnostic Technical Specifications:**
  - **Optical Colorimeter:** Professional-grade sensor for display profiling, white-point tracking, and luminance measurement to maintain reference monitor fidelity.
  - **Ambient Light Photometer:** High-precision digital lux meter capable of capturing wide-range environmental light levels (up to 100,000+ lux) to replicate harsh Yuma ambient sunlight conditions during field trials.
  - **Data Integration:** Software compatibility allowing dataset export for empirical documentation across tiered outcome scoring models (Bronze, Silver, Gold).

5. Dissemination Materials ($750 or In-Kind)

- **Operational Purpose:** Procurement of reference guides, student-facing accessibility toolkits, and faculty workshop materials produced locally via AWC Print Services.