

CASE STUDY

LED Technology Enables Seamless Restoration at Huntington Library

Project: Huntington Library Chandeliers, San Marino, California, USA

Luminaire manufacturer: Quality Lighting

Lighting Design: Geoff Korf, Associate Professor of Lighting Design, University of Washington

LED Module manufacturer: Xicato

The Huntington Library, along with associated Art Collections and Botanical Gardens was founded by industrialist and philanthropist Henry E. Huntington in 1919 in San Marino, California. The Huntington, as it is known, is one of the largest and most complete research libraries in the United States in its fields of specialization, containing a substantial collection of rare books and manuscripts, concentrated in the fields of British and American history, literature, art, and the history of science. Spanning from the 11th century to the present, the library's holdings contain 7 million items, over 400,000 rare books, and over a million photographs and prints.

Highlights include one of 11 vellum copies of the Gutenberg Bible known to exist, the Ellesmere manuscript of Chaucer ca. 1410, letters and manuscripts by George Washington, Thomas Jefferson, Benjamin Franklin, and Abraham Lincoln, as well as an extensive research collection focused on the history of the American West.



In 2013, a renovation was undertaken for the Main Exhibition Hall, a space that first opened in 1920. The goal was to reflecting the building's historic grandeur, while implementing an updated setting in which to display and protect the myriad of treasures. An important element in the restoration were three dramatic reproduction chandeliers which were to be custom-built and equipped with state-of-the-art LED lighting, to evoke the space as it looked in Henry Huntington's day. Since the original chandeliers were not available, the plan was set to make use of archival photographs in order to custom design and re-cast nearly exact copies of the originals. With so much time and effort required for that effort, it was impractical to

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custom design light engines, of any type, to provide illumination from inside the chandeliers. A ready-to-integrate solution was required.

In considering the type of lighting that would be needed for the space, the team focused on three important considerations: 1) Producing high-quality illumination that supported the feel of the original incandescent solutions; 2) Maintaining an overall low 5 foot-candle light level on the stacks, with 1 foot candle on the floor, to both highlight the collection as well as support preservation of the precious works; and 3) Implementing a straightforward approach to quickly increase lighting in a specific area when a researcher needed to access a particular work, or when cleaning or maintenance was being undertaken.

The solution was found in combining Xicato's Artist Series and Standard Series LED modules, combined with standard radial heat-sinks and available drivers that had been proven in previous projects. In all, 24 individual light-engines were mounted inside each of the approximately 4-foot chandeliers arranged in dual rows on a "fat propeller" type of mounting structure. The design effectively created three concentric circles, one of which consisted of the high-brightness 80 CRI used for maintenance and cleaning periods in the hall. In their normal operating condition, the 16 high-CRI Artist modules are illuminated to just 3% of their output to create a mood reminiscent of a by-gone era, but with an acknowledgement to a modern perspective with the choice of a more neutral 3500K color temperature. In addition to the chandeliers,



LSI Lumex 2024 fixtures, mounted on the floor of the mezzanine and featuring Xicato's XSM Series LED modules, are used to directly illuminate the upstairs bookcases. Upon entering the hall, a researcher seeking to retrieve a book can push a single switch to raise the lighting from the Artist Series modules in the chandelier level while lowering the LSI fixtures on the floor. The change in directionality, and accompanying increase in color rendering, allows quick identification of sought-for volumes in the arranged stacks, with the lights dimming back down automatically after a preset period.

According to designer Geoff Korf, "The blending of traditional and modern perspectives was one of the main challenges in the design. We had evaluated LED solutions five years earlier for a project, and could not find the kind of performance that would mimic the visual qualities of incandescent light, as well as address our concerns about harmful wavelengths and long term color-stability. This time around, with Xicato's support, we were able to demonstrate a solution that provided an outstanding quality of light, as well as the reliability and controllability that made it a clear-cut winner."