2004 Architectural Engineering Thesis

Glued-Laminated Timber

Architectural Redesign

Country Music Hall of Fame and Museum

Nashville, Tennessee

Pennsylvania State University
Architectural Structural Engineering
Spring 2004

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Consultant:

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COUNTRY MUSIC HALL OF FAME AND MUSEUM

222 Fifth Avenue South & Demonbreun ? Nashville ? Tennessee ? 37203

General

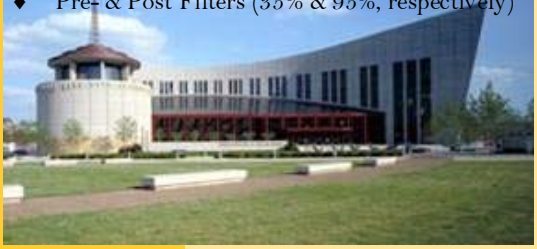
- 40,000 square-foot exhibit
- 11,000-square-foot conservatory
- 5,500 square-foot museum shop
- 2-story Archive and Library
- Ford Theater
- Full service restaurant
- XM Radio studio

Structural System

- 3 Buildings: Hall of Fame, Museum, & Conservatory
- Museum is a Steel Composite Structure
- Maximum Live Load: 350PSF for Records & Archives
- Diagonal & Chevron Bracing for Lateral Loads
- The Hall of Fame building and Cadillac Fin are architectural concrete with intentional oversized columns inside to give grandness
- Repetitive Forms Used for Symmetry
- Foundation Piers Range From 6'-24' Due to Variations in Bedrock Depth

Mechanical

- Field Assembled, Draw-Through, Variable/ Constant Volume System
- 6 Zoned Air Handling Units (137,410 CFM)
- 15% Min O.A. & 100% Maximum O.A.
- 100% Min O.A. for the Conservatory
- 4-Electric Humidifiers (200-400 lb/hr) to protect Exhibits and Hall of Fame
- 550,500 BTU/HR Preheat Coil to control inconsistent temperature variations in the glass-enclosed Conservatory
- 123,000 Gallon Hot Water Heater
- Pre- & Post Filters (35% & 95%, respectively)



Architecture

Conservatory

- The heavy steel frame is inspired by the railroads and bridges that connected the small towns where country music came to life.
- A symbolic steam follows the descending monumental stair represents the streams of the Appalachia and into the Mississippi Delta.

Museum

- The form of the museum inspires the country stores that feature large façades and signage but are really intimate spaces where people come to socialize and exchange information.
- The musical reference of the giant keyboard formed by the series of vertical windows positioned like ebony keys across the dominant, curved front façade.
- The tail fin of a '57 Chevy is inspired in the dramatic end of the concrete wall that rises above the street corner.

Hall of Fame

- The cylindrical shape is based on the water towers that nourished steam engines and grain silos dotting rural landscapes.
- A replica of the WSM tower pierces the rotunda roof.
- Four concentric circles representing the 78-, 45- and 33-rpm records and the compact disc create that stair stepping roof.

Construction

- Pre Construction December 1995
- Construction June 1999
- Finish May 2001
- Total Cost: $37,000,000

Electrical

- 3 Phase, 4 Wire, 277/480 Volts Wye & 120/208 Volts Wye
- 277/480 Volt Emergency Standby Engine Generator
- Illuminations: Incandescent, T8 Fluorescents, Cold Cathodes, Halogens, Metal Halides, & Neon

OWNER: COUNTRY MUSIC FOUNDATION
ARCHITECT: TUCK-HINTON ARCHITECTS
STRUCTURAL: EMC STRUCTURAL ENGINEERS
MEP: I.C. THOMASSON
CM: AM CONSTRUCTORS

DAVID L. CLARK II
STRUCTURAL EMPHASIS

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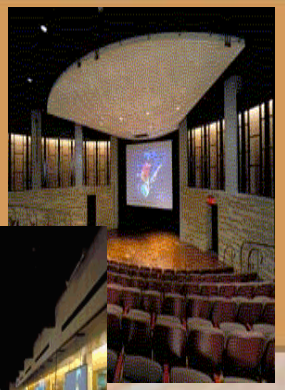
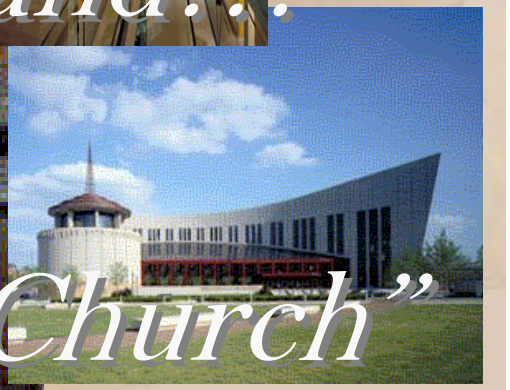
Country Music Hall of Fame & Museum





"A Bass Clef,..

a Cadillac fin, and...

an Old Country Church"

Pennsylvania State University

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