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Boyd's Bear Country
Pigeon Forge, TN



Technical Report 1

Structural Concepts / Structural Existing Conditions Report

Executive Summary:

Boyd's Bear Country, located in Pigeon Forge, Tennessee, is designed as a multi-functional space and tourist attraction for Boyd's Collections Ltd. The 112,620 square foot building houses three floors of retail space with multiple cashier and information desks, warehouse storage, a loading dock, a full sized restaurant, food court, ice cream parlor, special events areas, and offices.

In analyzing structural systems of Boyd's Bear Country it is quickly apparent that special considerations will have to be made to accommodate the use of multiple materials and unique applied loads in the structure. It implements structural steel, cold rolled steel, concrete slabs, cast-in-place concrete walls and foundations, reinforced concrete block, wooden trusses, and wooden members. Later studies of the building will require more in-depth research as to the effects of incorporating such a great number of materials into one building.

This report investigates the existing structural conditions and design concepts of the building, as well as redesigns of typical members within the building. A brief summary of these systems is as follows:

The main structural system of the building is composed of a steel grid supporting composite slabs. Wooden trusses support the roof, covered in plywood sheathing. Lateral resistance is provided by concentric braced frames and masonry shear walls. Foundations consist of shallow footings and piers, built as a mixture of cast-in-place concrete and masonry. No expansion joints are present in the structure.

The original design was performed using the 1999 Standard Building Code and its respective related codes. Loadings were determined using ASCE 7-95 and ASCE 7-98 and original member selections were chosen using AISC Manual of Steel Construction, Allowable Stress Design, 9th Edition (1989).

A redesign of typical members used similar loading requirements and a selection of members from AISC Steel Construction Manual, 13th Edition (2005). The design of these typical members resulted in similar selections to those used in the original design and construction. Variations in design can be attributed to variations in modeling of loading conditions and simplification of design, such as the influence of connections and block shear.