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Boyds Bear Country  
Pigeon Forge, TN



## **Executive Summary**

Boyds Bear Country, located in Pigeon Forge, Tennessee, is designed as a multi-functional space and tourist attraction for Boyds 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, and special events areas are scattered through the building, and offices occupy the fourth and top floor. The building is massive in scale, with each floor measuring 17'-8" in height.

The structural framing as originally designed at Boyds Bear Country is primarily a composite steel grid with wooden roof trusses and masonry retaining / foundation walls. Standard steel shapes used as beams and girders support metal deck and 3 inches of cast-in-place concrete. The lateral system consists of concentric braced frames, some of which are encased in masonry at the lower level. Shallow foundations secure the building to the site.

In studying the existing structure of Boyds Bear Country, it became apparent that the building, as constructed, implemented a wide variety of materials and methods of construction. Not only does this create added difficulties in the design and analysis of the structure, but the coordination of trades and site work became more difficult than originally intended.

Two options are studied in this report: a pre-cast concrete structural system and an engineered wood structural system. These are studied and compared for their structural efficiency, cost, schedule, coordination impact, and architectural impact.

A pre-cast concrete system can be implemented to replace the current one, reducing the number of required trades on site. This design features a floor system of double-tees supported with pre-cast members. The lateral force resisting system of the structure is made of pre-cast concrete panels. All masonry in the building is replaced with concrete. The design includes fewer pieces, and larger bay sizes, opening the retail floors up for maximum utilization of space. It exhibits a decreased cost, more compact construction schedule, and a decrease in the required trades. However, the concrete does not fit the overall aesthetic design of the building and would have to be masked in a fashion similar to the existing structure.

An engineered wood system allows for the most seamless integration of a structural system into the desired aesthetic design. The gravity system is a combination of open-web wooden joists and parallam. The lateral force resisting system is made fo pre-cast concrete panels. All masonry in the building is replaced with concrete. The application of wooden columns and girders creates a look of nature and tradition applied in an updated, oversized fashion. The implementation of a wooden system would create a greater number of columns in the floor plan and retain area; however they could be incorporated into display functions. This system also exhibits a decreased cost, more compact construction schedule, and a decrease in the required trades.

It is recommended that a pre-cast concrete system be implemented in the design of Boyds Bear Country.