



## **Conclusions**

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Boyd's Bear Country  
Pigeon Forge, TN



## **Conclusions:**

### **Summary**

The original structural design of Boyd's Bear Country was accomplished with a composite steel system. This basic system is supplemented with wooden roof trusses, masonry walls, and concrete slabs. The inclusion of all of these systems creates difficulty in design and construction.

A pre-cast concrete system can be implemented to replace the current one, reducing the number of required trades on site. This design includes fewer pieces, and larger bay sizes, opening the retail floors up for maximum utilization of space. 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 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.

Both replacement systems show a decrease in cost and construction time.

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### Comparison of 3 Systems

Area of Concern:	Original Composite Steel System	Pre-Cast Concrete System	Engineered Wood System
<b>Gravity System</b>	30' x 30' Bays	30' x 45' Bays	22.5' x 30' Bays
	3 Beams per Bay	2 Double-Tees per Bay	Joists at 2' OC
<b>Lateral System</b>	Combination of Steel Frames and Masonry	Decreased Number of Columns Pre-Cast Panels	Increased Number of Columns Pre-Cast Panels
<b>Foundations</b>	Seismic Controlled 2.08" Deflection	Decreased Number of Members Seismic Controlled 0.174" Deflection ~15% Larger by Volume Less Formwork required	Decreased Number or Members Wind Controlled 0.461" Deflection ~25% Smaller by Volume More Formwork Required
<b>Cost / Schedule / Coordination</b>		\$78,800 Savings	\$1,420,00 Savings
<b>Architecture</b>		Decreased Construction Time Less Site Construction Required Fewer Contractors Required Reduced Number of Columns Finish Work Required	Decreased Construction Time Less Site Construction Required Fewer Contractors Required Higher Number of Columns Less Finish Work Required

### Recommendation

It is recommended that the pre-cast structural system be utilized in the design of Boyd's Bear Country in Pigeon Forge, Tennessee. This option creates a streamlined structural system with larger bays, fewer columns, and decreased number of required materials, a decreased amount of site work, and an overall savings of more than \$78,800.

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