

**Arkansas State Highway and Transportation Department
Transportation Research Committee**

RESEARCH PROBLEM STATEMENT

DATE: 09/16/2016	PROJECT AREA: Special Projects
TITLE: Evaluating Effects of Vibration from Construction/Use of Transportation Structures on Bluff Shelters/Caves	
PROBLEM STATEMENT: When determining the potential effect a project may have on an archaeological site, indirect effects as well as direct impacts must be considered. In evaluating effects, construction methods, including blasting and moving equipment are key components. Excavators, cranes, graders, etc., can weigh 80-100 metric tons. Effects from vibration, compaction or destabilization of subsurface soils from excavation are possible. Vibrations from pile driving construction shoring or bridge footings can exceed forces created by earthquakes. There may also be long term effects from vibration and compaction caused by use of the transportation facility over time.	
OBJECTIVES: 1) What research literature is currently available concerning the surface and subsurface effect of vibration; determine if it can be applied to bluff shelters and caves, 2) To determine the levels, depth, distance and effects of vibration from the construction blasting and use of transportation structures in bluff shelters and caves, and 3) What effects does vibration have on archaeological sites and what are the thresholds for these effects? (i.e. does vibration and the resulting compaction only effect the individual artifacts or is vibration significant enough to also destroy stratigraphic relationships? What are the vibration thresholds for these effects in the short and long term?)	
FORM OF RESEARCH IMPLEMENTATION: A literature review should be performed to determine the current information on the subject. Blasting will be used on Job 009784 over bluff shelters. These sites will be excavated to ensure protection of the artifacts, so they would be ideal for monitoring the structural effects of the blasting in the short term to determine vibration effects on bluff shelters and caves, and later assessed for longterm effects of use of transportation on the structures.	
REVIEWER: Christopher McKenney Estimated Project Duration: 24	
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Standing Subcommittee
Ranking

4 / 7

Advisory Council
Ranking

20

Statement Combined with
Statement Number(s)
