

Executive Summary Revision

Project: Memphis Airfield Improvements Related to the Structural Requirements for the Airbus A-380.
(AFRAM Project # 05-105)
Date: February 6, 2007
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Scope of Work & Assumptions

The writer was to perform a structural analysis of the existing Hurricane Creek Box Culvert, Taxiway Yankee Tunnel, and Winchester Road Tunnel. This analysis was to be related to the structural requirements of the Airbus A-380.

The analysis was to begin with an analysis of the structures assuming there was no soil cover, and the aircraft load was directly applied to the top slab of the structures. If the structure was sufficiently designed for this condition no further analysis was to be done. If the structure could not handle this condition, the amount of cover required for the structure to handle this loading was to be determined and compared to actual cover under pavement and directly adjacent.

The loads of the Airbus A-380 were taken from product literature, and are included in Appendix A of the report. The respective wing, body, or nose gear load was distributed across their respective wheel pattern, also found in Appendix A. This area consisted of a single row of wheels per landing gear. This was done to account for the fact that when landing the loading is rarely distributed amongst all the wheels equally at first.

In cases where the loads were required to be transferred through soil cover over the structures, the loads were distributed at 45-degree angles through the soil in both the longitudinal and transverse directions with respect to the aircraft direction. Once this was determined, a unit width of 1'-0" of the structure was analyzed for the worst case scenario/loads.

When considering the horizontal loads applied to the structures, the braking forces of the aircraft were not considered during normal loading since we used full load only on a single row of wheels per landing gear. Also it was assumed that the loads would be resisted by the horizontal soil loads on the structures. During a seismic event, 20% of the vertical loads were applied in the horizontal direction and the resisting soil forces were not included to account for soil liquefaction.

Hurricane Creek Box Culvert

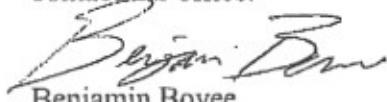
The Hurricane Creek Box Culvert evaluation concluded that the structure can handle the loads of the Airbus A-380 as long as the soil/cover depths are at least 6'-0". It was

determined from a field survey that the actual cover over the box is at least 10'-0". This concludes that the box can sufficiently handle the loads imposed by the A-380.

Winchester Road Tunnel & Taxiway Yankee Tunnel

The evaluation of these two structures included the top slab, girders, interior and exterior walls. The footings for this structure were not checked at this time due to lack of soil information. It was determined that these structures can handle the loads imposed by the Airbus A-380 given 6'-0" of cover. Additional calculations sheets are attached for reference regarding these structures. Also, a sketch is included to illustrate the method used for distributing the loads imposed by the A-380.

If there are any further questions or concerns regarding this evaluation, please feel free to contact our office.



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