Concrete Overlays for Airfield Pavements Webinar – May 10, 2022 – Q&A

The questions submitted during the webinar follow with answers that our speakers have provided.

Key resources available include:

- AC 150/5320-6G Airport Pavement Design and Evaluation
- AC 150/5380-7B Airport Pavement Management Programs
- AC 150/5370-10H Standard Specifications for Construction of Airports
- AC 150/5335-5D Standardized Method of Reporting Airport Pavement Strength – PCR
- Hercules Way Gets an Upgrade ACPA Concrete Pavement Progress, Quarter 3, 2021
- Concrete Overlay Guide - 4th edition CP Tech Center Concrete Overlay Guide

1. What are the typical ways transitions to existing taxiway connectors are constructed? The runway overlay may raise the grade 6"+. Are there issues maintaining FAA standard longitudinal grades? Arkansas

   Most of the time the transition has been wedged with asphalt back to grade while maintaining FAA grade standards. Darlington County (SC) Airport did elect to use (8-inch) P-501 for the TW connector transitions without any known issues.

2. How often do you recommend paving maintenance (seal joints, seal cracks, others), what is the cost per year? El Salvador

   Depends on local conditions. FAA requires airports to have a pavement management system program and the maintenance plan and cost is developed from the local conditions. Refer to AC 150/5380-7B.

3. Have there been any Roller Compacted Concrete Overlays of Airports? Florida

   We are not aware of any airside aircraft pavements constructed with RCC and if there has been we assume they would have been done with an approved modification of standards (MOS) since RCC is not an approved FAA aircraft pavement standard. Check with your local Airport District Office (ADO). However, we are aware that Hercules Way at Donaldson Center Airport in SC has done a landside RCC pavement project.

4. How do you estimate the PCI? Florida

   Generally, the pavement deterioration curves are developed during the development of the pavement management system. Over time, pavement distress data is collected, and models of similar pavement types can be developed to a family of curves to predict PCIs over time.

5. Will there be any vertical displacement when the asphalt substrate is overlaid by concrete? Florida

   No vertical concerns once the concrete overlay is in-place. The existing asphalt should be investigated to determine if pavement structure is capable of handling

construction loads. The amount (CY) of concrete delivered to paver can be reduced or the contractor may wish to use runway shoulders to haul trucks to paver.

6. Are macro synthetic fibers being incorporated into airfield overlays? Georgia

   Normally, fibers are not used in FAA pavements. The FAA pavement standard is jointed plain concrete. Reinforcement is only used for odd-shaped or over-sized panels. Projects may exist where fibers have been used but that would likely have been done using a modification to standards (MOS). Refer to AC 150/5320-6G.

7. When doing bid alternates - did the engineer fully design (joint plan, etc.) the concrete overlay and produce secondary plan sheets for the bid? Georgia

   Yes, secondary plan sheets were produced for the alternate design that included a jointing plan. As shared during the webinar, the engineer of record should consider alternate pavement jointing plans from the contractor as long as they remain consistent with the FAA pavement design circular. Refer to AC 150/5320-6G.

8. Can we go for overlay in airfield pavement after 45 years of its construction? India

   Definitely! Although a 20-year design is the FAA current standard, an airport may elect to design a pavement structure for longer periods. In fact, the concrete overlay at John F Kennedy Airport in New York is commonly referenced as a 50-year design. The Iowa slide (toward the end of presentation) illustrated that unbonded concrete overlays of asphalt (or concrete) will normally last longer than the FAA 20-year design life, provided pavement maintenance is accomplished in a timely fashion.

9. How did the FAA approve the concrete overlay that exceeded the HMA overlay? Or was this not funded by the FAA? Indiana

   Most of the projects shared during my presentation were funded by the FAA ATL or MEM Airport District Offices. The advertisement and bid documents shared the method of award and the Engineer of Record typically covered this during the pre-bid meetings. As depicted during the presentation, several of the projects stated a preference for the low bid concrete option, provided FAA funds were made available. I'll be happy to provide a copy of an advertisement if you will contact me at gdean@acpa.org

10. We at HNB are looking at options to increase our ACN- PCN strengths, in 3-5 yrs. Indiana

    Concrete overlays will certainly increase an airport pavements' PCR. Note that ACN/PCN is only being use during an interim period and the FAA is switching to ACR/PCR to be compatible with current FAA pavement design procedures. Refer to AC 150/5335-5D.

11. Why were dowels only on longitudinal joints? Indiana

    Per the FAA Design Circular, dowels are typically only used along longitudinal construction joints. Except for the last three joints at the runway ends, all interior contraction joints are dummy (aggregate interlock). I would add a few of our larger commercial airports in our region have received permission from FAA to use dowels on the interior contraction joints. Refer to AC 150/5320-6G.

12. Did the consultant use LCA to justify the use of concrete for the Lancaster County? Maryland

    A life cycle cost was accomplished to substantiate the case for bidding alternates for this airport. At the pre-bid meeting, there was a stated preference to award the contract to the low bid concrete alternate provided FAA funds were made available for the project.

13. Do joints need to be filled? Maryland

    Yes, P-501-2.4 shares the need to seal the pavement joints that meets the requirements of P-604 or P-605. Refer to AC 150/5370-10H.

14. Does the lighter color of concrete help with flying stability of the smaller aircraft, i.e. heat rising from darker asphalt result in cross winds or near surface wind instability? Maryland

    This would be a question for a pilot; however, the cooler temperatures from the lighter color pavement should require less runway distance for aircraft on departure.

15. Concern always with concrete vs asphalt is time to construct, and time to cure before opening. Is that also factored into your comparisons? Massachusetts

    I'm sure the engineer of record reviewed required contract times with their client. Where concrete overlays are typically used, the existing pavement conditions would require any asphalt alternative to be remove and replace the existing pavement structure or possibly recycle in-place (P-207). Thus, the contract times are typically about the same or may be even shorter using the concrete overlay strategy.

16. When using highway specs or compressive acceptance strengths for airfields with 30k/60k aircraft and less, does FAA still require ASR testing of fine and/or coarse aggregates? Michigan

    FAA will still require ASR testing, even when state specifications are elected to be used for specific projects that meet load criteria.

17. What is the minimum recommended PCCP thickness for overlaying existing PCCP? New York

    Note #2 under Table 3-4 states a 5-inch minimum for pavement thickness provided all aircraft weights are less than 30,000 pounds. Refer to AC 150/5320-6G.

18. Can we use aggregate as a separation layer? Ontario

    We (ACPA) do not recommend using aggregate as a separation layer for a concrete overlay. That would constitute a "sandwich" layer, which is not an FAA standard. Refer to AC 150/5320-6G.

19. The other option of separation layer is geotextile or geogrid? Please clarify. Ontario

    The separation layer should be a fabric that meets the requirements of AASHTO M 288 Class I fabric with elongation not less than 50% at the specified strengths, with a weight not less than 14.5 oz/sy. A certificate of compliance (COC) should be provided by the fabric manufacturer that the material may be used as a bond breaker

for a concrete overlay. Refer to the language in FAA AC 150/5370-10H, *Item P-501, Paragraph 2.12 Bond Breaker*.

20. What is the recommended thickness of asphalt separation layer? Is it a structural layer? Ontario

    An asphalt separation layer is not a structural layer. We (ACPA) would follow the CP Tech Center's recommendation and have a minimum thickness of 1-inch. Refer to the Concrete Overlay Guide - 4th edition.

21. Did the FAA have to pre-approve allowing bid alternates letting the sponsor choose a low bid asphalt or concrete pavement option? Pennsylvania

    Each FAA Airport District Office (ADO) might be different, but I would say Yes. It would be a good idea for the engineer to have that conversation with the ADO. The only exception might be the Block grant states where the FAA has given the state the right to make decisions on when to bid alternates.

22. Does FAA allow macro-fibers? If so, would you recommend using? Pennsylvania

    Refer to question 6. We could see benefits to fibers instead of reinforcing for increasing panel sizes and for odd-shaped panels. However, since fibers are currently a non-FAA-standard, a MOS would likely be necessary.

23. With cement and fly ash material availabilities being low, what costs should engineers use when developing cost estimates for construction in late 2022 or 2023? Tennessee

    It would be my suggestion that you reach out to the ACPA Chapter that represents your state. The chapter Exec (or staff) should be able to help you with cost estimates or put you in touch with local members that can provide this type of assistance. Refer to the ACPA Chapter Assistance resource.

24. Can PCCP paving be used for shoulders? The Netherlands

    Definitely! Chapter 6 of the FAA Pavement Design Circular discuss options for paved shoulders. Nashville International Airport recently completed a runway reconstruction project where the shoulders were constructed of concrete. Refer to AC 150/5320-6G.