

Construction Cycle 8 Plans

Presented to: FAA Airport Pavement Working
Group Meeting
By: David R. Brill, Ph.D., P.E.
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Federal Aviation
Administration



CC8 Objectives

- **Primary Objectives**

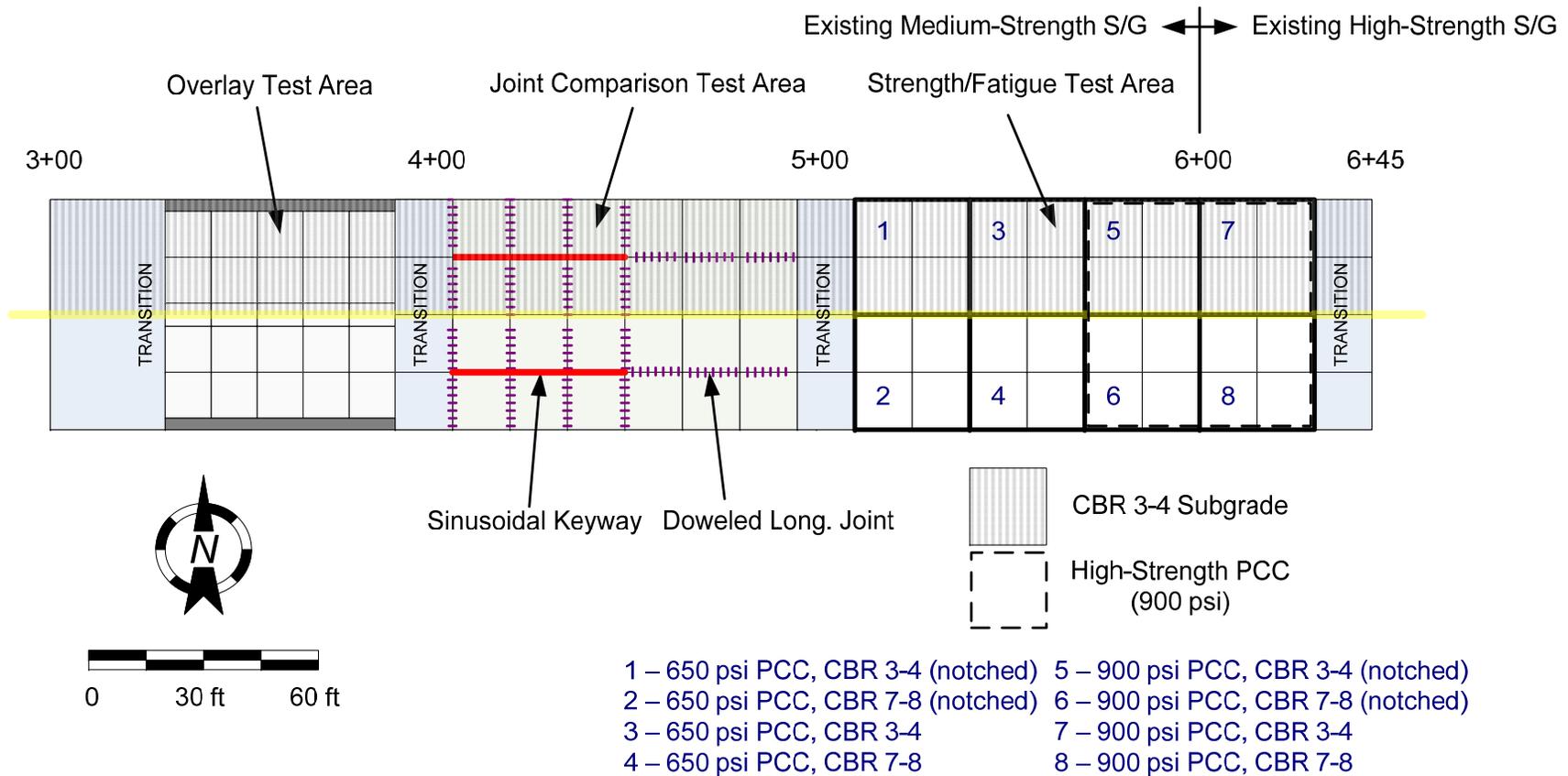
- PCC-on-Rigid Overlay Test. Test PCC overlay on existing PCC with SCI in 50-80 range (Follow-on to CC4 overlay tests).
- Evaluate Comparative Joint Performance.
 - Longitudinal Joint: doweled versus alternate sinusoidal key.
 - Transverse Joint: doweled versus undoweled (dummy).
- Improve FAARFIELD Failure Model. Test full-scale slab strength & fatigue strength for different concrete strength and foundation conditions.

- **Secondary Objectives**

- Develop overload criteria for rigid pavements.
- Effect of k-value vs. CBR in characterizing rigid subgrade.

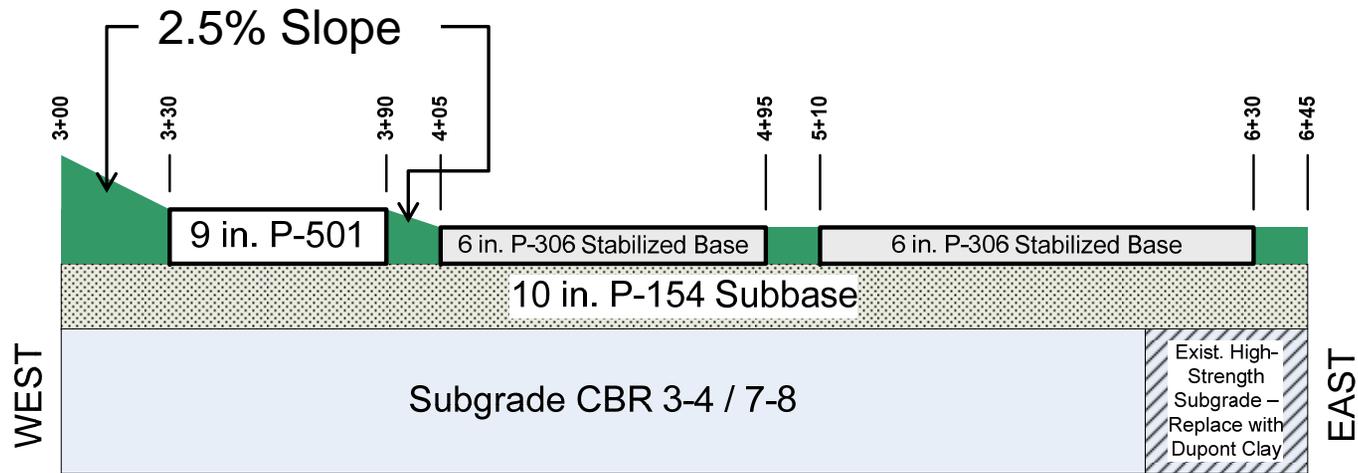
CC8 Concept Layout

CC8 Concept Layout III

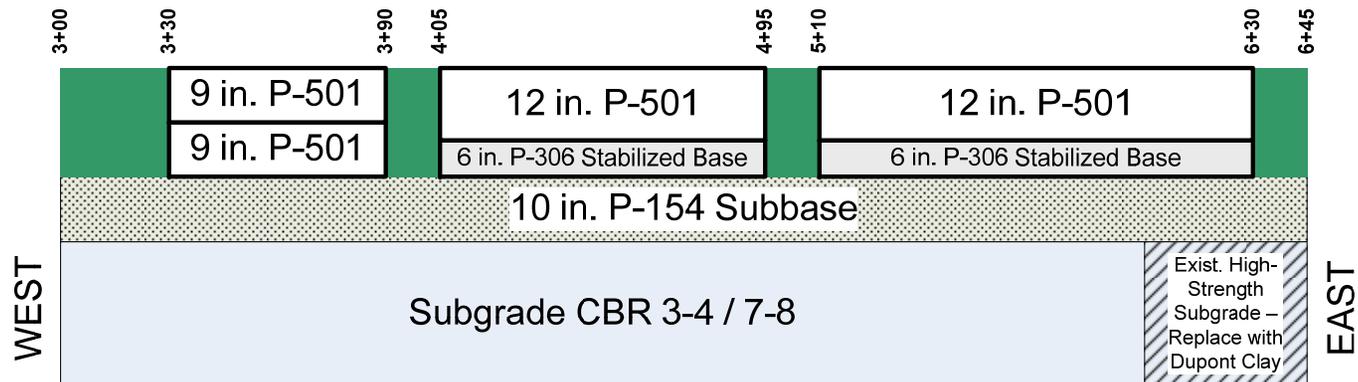


Proposed 2-Phase Build-Out

PHASE 1



PHASE 2

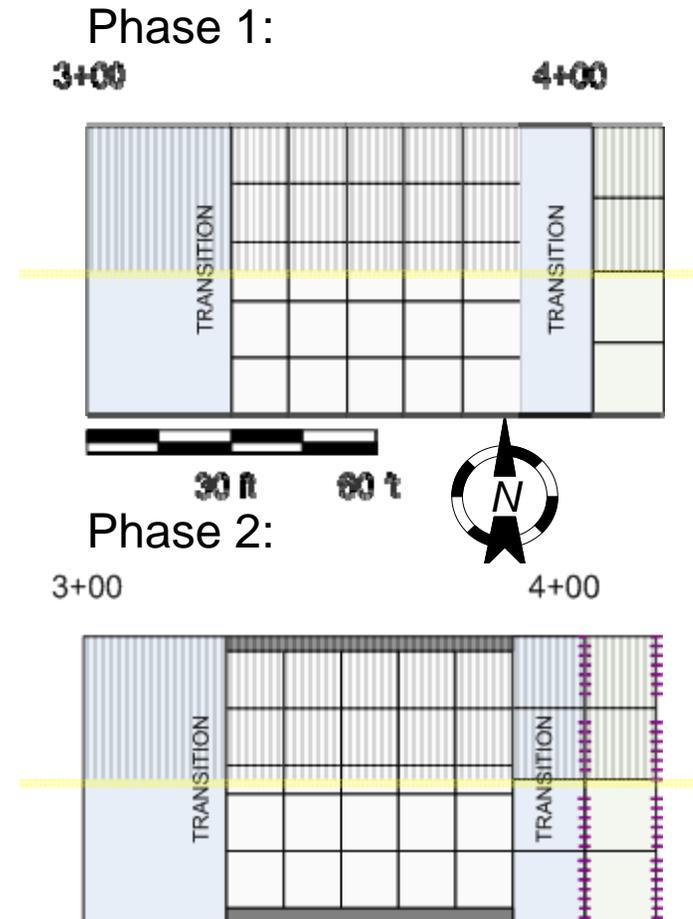


Overlay Test Area (1)

- **Follow-on to CC4 overlay tests (IPRF).**
 - Described in IPRF Reports 04-2 and 06-3.
 - Phase 1 test (2006) was on new PCC (SCI 100).
 - Phase 2 test (2007-8) was on highly deteriorated base PCC. (SCI 28 - 43 for 1:1 ratio of overlay-to-base PCC thickness).
- **Need additional data for intermediate base PCC condition (target SCI 50-80).**
- **Plan to traffic base PCC to attain the target condition prior to placing overlay.**

Overlay Test Area (2)

- **Overlay slabs 12x12 ft.**
- **9 in. thick, 1:1 ratio of overlay to base PCC.**
- **Longitudinal joints: staggered.**
- **Transverse joints: aligned.**
- **No dowel baskets used.**
- **2 support conditions:**
 - CBR 3-4 north
 - CBR 7-8 south



Rigid Overload Testing

- **Phase 1 trafficking of base PCC is planned to achieve the preferred SCI.**
- **This offers an opportunity to study overload criteria for rigid pavements.**
- **ICAO Annex 14, 19.1, states that:**
“occasional movements by aircraft with ACN not exceeding 5 per cent above the reported PCN should not adversely affect the pavement.”
- **Full-scale data are needed to test this criterion.**
- **Results from CC6 (MRS-2) suggested that one-time loads up to and exceeding the rupture load do not necessarily impact rigid pavement life.**

Joint Comparison Tests

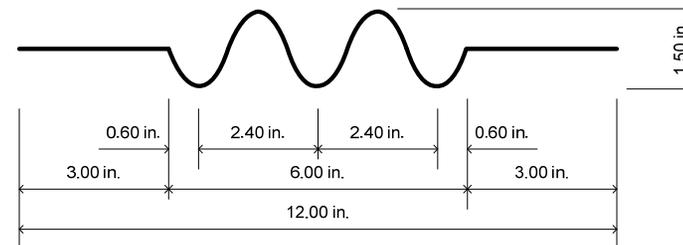
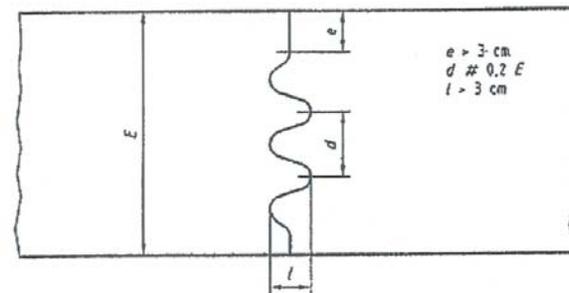
- **Questions to be answered:**
 - Do doweled and dummy transverse joints provide equal pavement life for equal thickness & traffic?
 - Does the European-style sinusoidal keyed joint provide equivalent performance to standard dowels for longitudinal joints?
 - Does subgrade strength affect relative performance of doweled and dummy transverse joints?
- **Target flexural strength = 650 psi (all P-501)**
- **Do we need to revisit slab curling?**

Sinusoidal Profile Key Joint

Example at CDG Airport,
Paris, France (*Gomaco*)

Joint Geometry

E.1 Exemples de joints conjugués de construction permettant d'assurer le transfert de charges

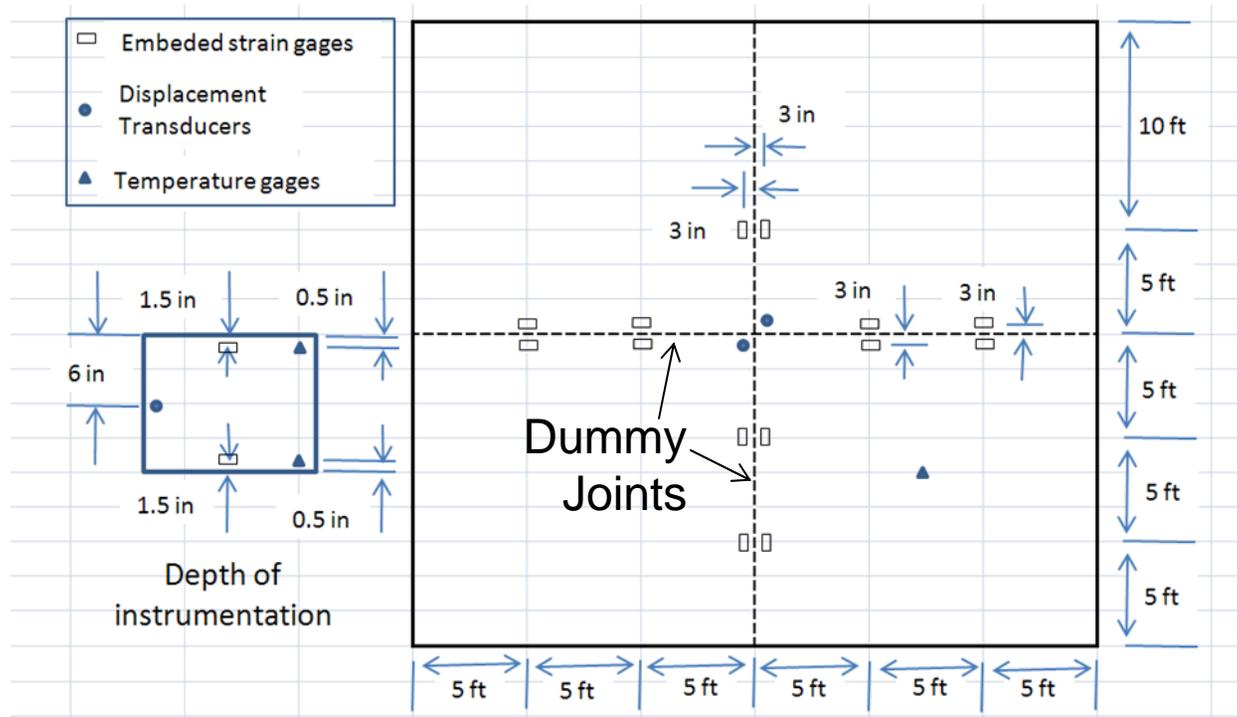


Slab Strength/Fatigue Tests (1)

- **Dedicated area for measuring slab strength and fatigue strength under full-scale loads.**
 - Observe different failure mechanisms for top-down and bottom-up cracks.
 - Observe crack propagation under vehicle load.
 - Different concrete strengths and support conditions.
 - Limited traffic – no wander.
- **Continuation of slab strength experiments begun as CC6 preliminary tests.**

Slab Strength/Fatigue Tests (2)

Typical Instrumentation Layout for 4-Slab Group



Acknowledgment: Dr. Edward Guo

Preliminary Test Matrix

Slab Group Designation	PCC Strength, psi	Target Subgrade CBR	Bottom Notch Condition
1	650	3 - 4	Notched*
2	650	7 - 8	Notched*
3	650	3 - 4	Plain
4	650	7 - 8	Plain
5	900	3 - 4	Notched*
6	900	7 - 8	Notched*
7	900	3 - 4	Plain
8	900	7 - 8	Plain

*Notched slabs will be used for bottom-up crack propagation under traffic.

CC8 Tentative Schedule

- **Start CC6 demolition: July 2013.**
- **Complete CC6 post-traffic tests: Aug. 2013.**
- **Begin CC8 Phase 1 construction: Aug. 2013.**
- **Begin CC8 Phase 1 trafficking: Jan. 2014
(or based on NAPTF vehicle availability).**
- **CC8 Phase 2 construction: Spring 2014.**
- **CC8 trafficking/testing: Spring/Summer 2014.**

Questions?

