

【習作四】

Types of Overlays and Their Functions

Design of Overlays for Concrete Pavements

Design of Overlays for Flexible Pavements

- 一、試簡述美國AASHTO鋪面加鋪厚度設計的基本理念與方法。AI與PCA鋪面加鋪厚度設計的基本理念又為何？
- 二、在鋪面評估與維修講義第 722~725 頁之加鋪設計實例中，若改採 1993 年 AASHTO 加鋪設計法，請詳細計算其結果。
- 三、請以手算與利用 PAS5 程式計算的方式，並採用 1993 年 AASHTO 加鋪設計法協助驗算下列各種加鋪設計之實例：[請自行訂定基本輸入資料]
 - (a) AC over AC
 - (b) AC over Beaked PCC
 - (c) AC over JPCP, JRCP, CRCP
 - (d) AC over AC / JPCP, AC / JRCP, AC / CRCP
 - (e) Bonded PCC over JPCP, JRCP, CRCP
 - (f) Unbonded PCC over JPCP, JRCP, CRCP
 - (g) PCC over AC
- 四、請您利用美國混凝土鋪面協會(American Concrete Pavement Association)之鋪面分析程式(Pavement Analysis Software)，協助二高後續計畫南投路段之柔性鋪面與剛性鋪面之細部設計。
- 五、A three-layer flexible pavement was constructed in 1984. The existing pavement was on a 4-lane divided highway (two lanes in each direction). The original design and performance of the existing pavement is listed as follows:
 - Pavement Structure = 3 in. asphalt concrete,
12 in. granular base, and
silty clay subgrade.
 - Existing serviceability index = 2.8
 - Accumulated 18-kip ESAL = 5 million in the design lane (outer lane)

This pavement is being considered for major rehabilitation to carry additional 12 million ESALs in the design lane for 15 years. The terminal PSI is set to 2.5. The existing pavement has been tested with a Falling Weight Deflectometer and the following data was obtained:

FWD Load = 9,000 pounds

Radius of load plate = 5.9 in.

Measured deflection basin:

Offset Distance (in.)	Deflection (mils)
0	43
12	20
24	11
36	8

- (a) Use the AASHTO thickness design procedure to determine the require AC overlay thickness.
- (b) Use the Asphalt Institute design procedure to determine the require AC overlay thickness. The following deflection data was obtained with a Benkelman Beam device:
- Mean deflection = 0.038 in.
 - Standard derivation = 0.004 in.
 - Mean pavement temperature = 80 °F