

【習作一】

Project Survey and Distress Identification

- 一、試列舉兩種柔性鋪面(AC)與剛性鋪面(JPCP, JRCP, CRCP)之主要破壞型式，並簡述其成因。
- 二、剛性鋪面之基本構造：
 - (1) 剛性鋪面是否一定要加鋼筋？
 - (2) 加鋼筋之主要用途為何？
 - (3) 混凝土版下方加設基層之主要功用為何？
 - (4) 一般是否以抗壓強度作為混凝土版之材料性質？為什麼？

柔性鋪面之回算與結構評估

- 一、何謂NDT？在選用公路與機場鋪面之NDT試驗儀器時，若有Dynalect、Road Rater、及Dynatest FWD等三種儀器可選用，純以工程角度為考量，您會較傾向於採用何種儀器？為什麼？
- 二、在彈性模數回算程式中，試比較BISDEF與MODULUS程式之優缺與異同點。
- 三、請利用BISAR程式分析一系列典型的鋪面系統，以協助建立如鋪面評估與維修講義第126頁之DMD, SCI, 與BCI之關係表。
- 四、請利用BISDEF程式協助分析如補充講義第B-8頁之二層鋪面系統之相關NDT試驗資料。並請利用陳建桓、李英豪「由面層撓度質回算鋪面彈性模數的初步研究」一文之相關公式驗算其結果。
- 五、A three-layer flexible pavement has been tested with a Falling Weight Deflectometer and the following data was obtained:
Pavement Structure: 3 in. asphalt concrete, 12 in. granular base, silty clay subgrade

FWD Load = 12,000 pounds
 Radius of load plate = 5.9 in.
 Measured deflection basin:

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

Estimate the elastic modulus of each layer using the BISDEF program, assuming full adhesion along the layer interfaces. Make additional proper assumptions, if necessary.

- 六、 Using the results obtained from above, compute critical strains at the bottom of the AC layer and on the top of the subgrade layer. The elastic layered program, BISAR, can be used for this purpose. Also compute the expected or "allowable" number of load repetitions to "failure" using the following AC fatigue model and a subgrade permanent deformation model developed by the Corps of Engineers.

$$(a) \log_{10} N_{ac} \mathbf{N} > 5.01 * \log_{10} TSTRAIN < 2.6651 * \log_{10} \frac{E_{ac}}{14.22} < 0.392$$

$$(b) N_{sg} \mathbf{N} \frac{0.005511}{VSTRAIN}^{6.527}$$

Where:

- TSTRAIN = tensile strain at the bottom of the AC layer;
- E_{ac} = elastic modulus of the AC layer, psi;
- VSTRAIN = vertical strain on the top of the subgrade soil; and
- N_{ac} and N_{sg} = allowable load applications based on above two equations.