الباب الثامن

المراجع والملاحق

8.1 المراجع:

المراجع العربية:

- محمد فهمي غانم ، هندسة الطرق (التصميم الهندسي و الإنشائي)، دار الرتب الجامعية، بيروت، 1985.
- محمود توفيق سالم، هندسة الطرق والمطارات، دار الراتب للنشر، الطبعة الثانية بيروت، 1984
- شريف فتحي الشافعي، التصميم الإنشائي لطبقات الرصف المرن، دار الكتب العلمية، 2003
- علي محمد عبد الله راجح واخرون، هندسة طرق ونقل ومرور، جامعة صنعاء ،٢٠١٠م.
- وزارة التخطيط العمراني و المرافق العامة، جداول تحويل الحصر الى esa.

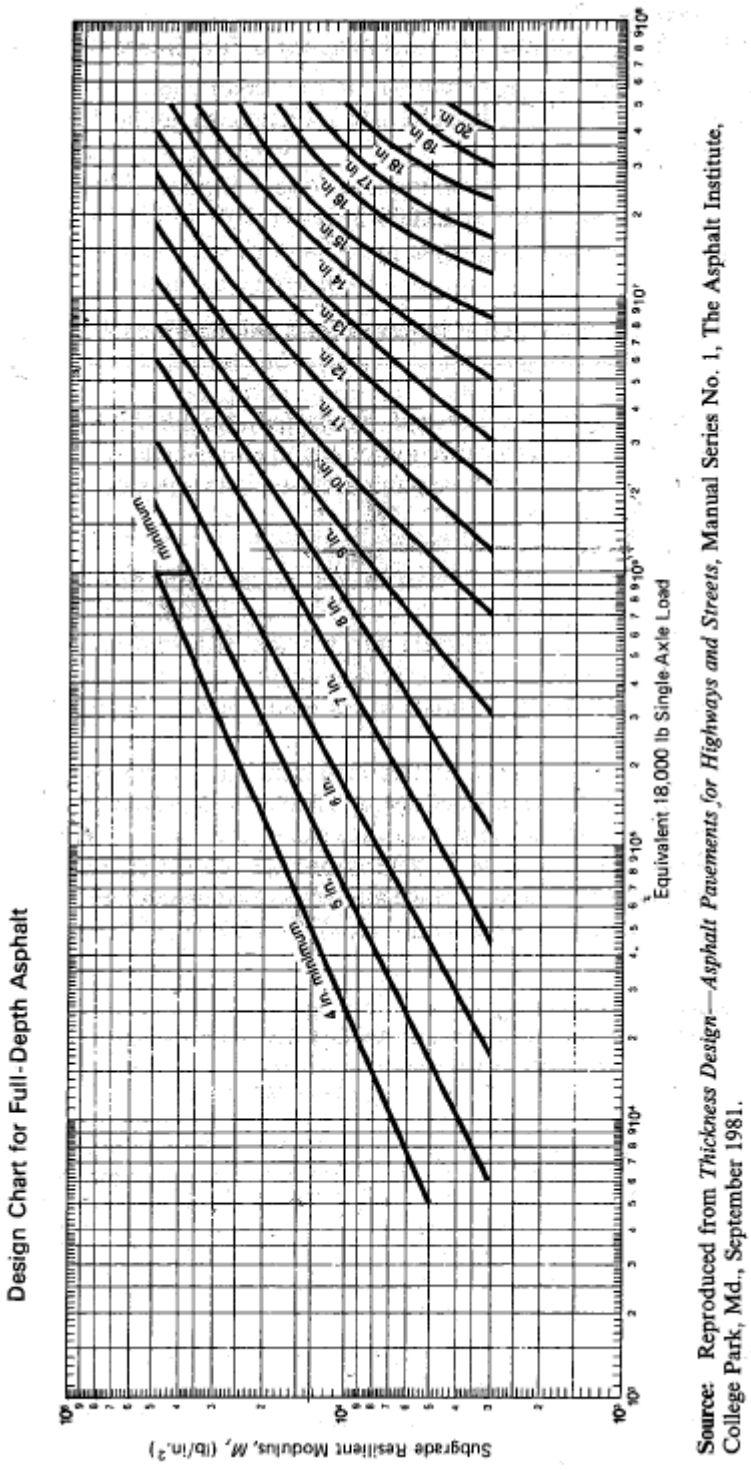
المراجع الإنجليزية:

- AASHTO (1993) Guide for design of pavement structures. American Association of State Highway and Transportation Officials. Washington
- TRL, Overseas Road Note 31, Forth Edition-1993
- The Asphalt Institute, Thickness Design – asphalt pavement structures for highway and streets.

8.2 الملاحق:

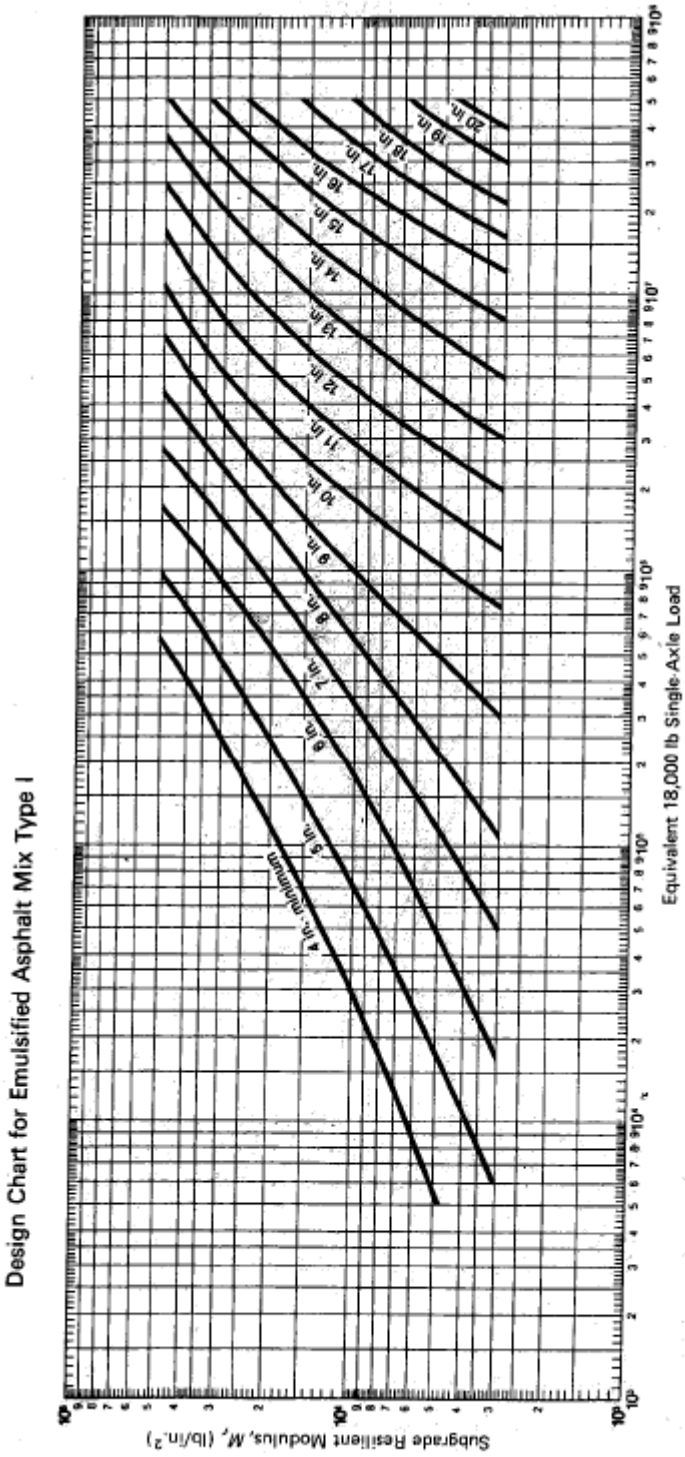
ملحق (1) مخططات التصميم بطريقة معهد الأسفلت AI:

المخطط (1)



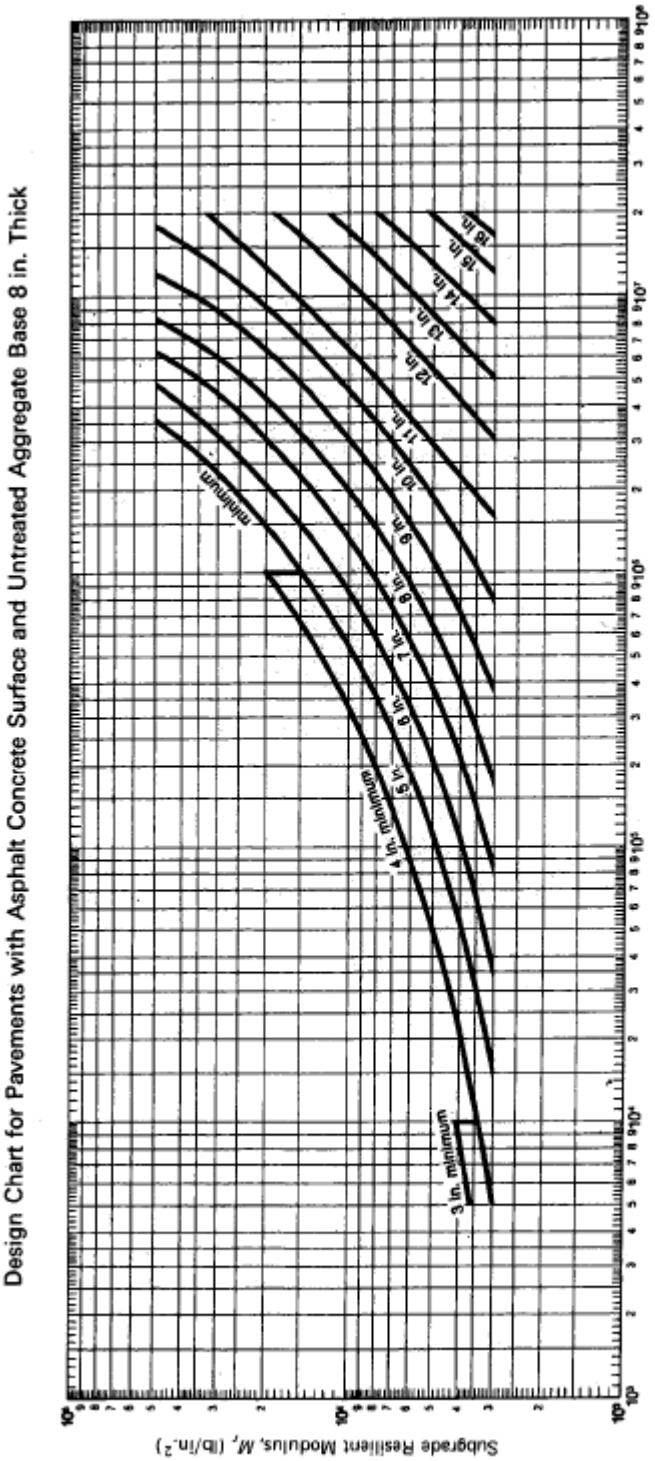
Source: Reproduced from *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, The Asphalt Institute, College Park, Md., September 1981.

المخطط (2)



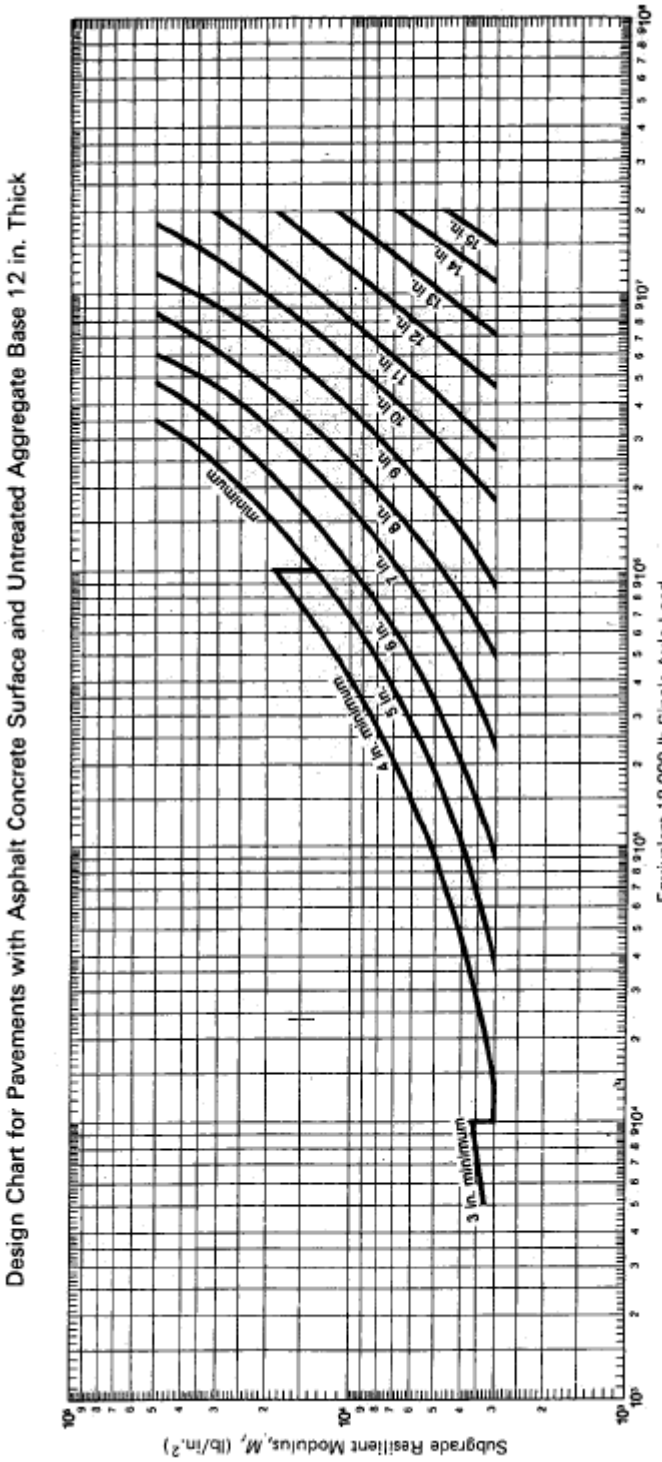
Source: Reproduced from *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, The Asphalt Institute, College Park, Md., September 1981.

المخطط (3)



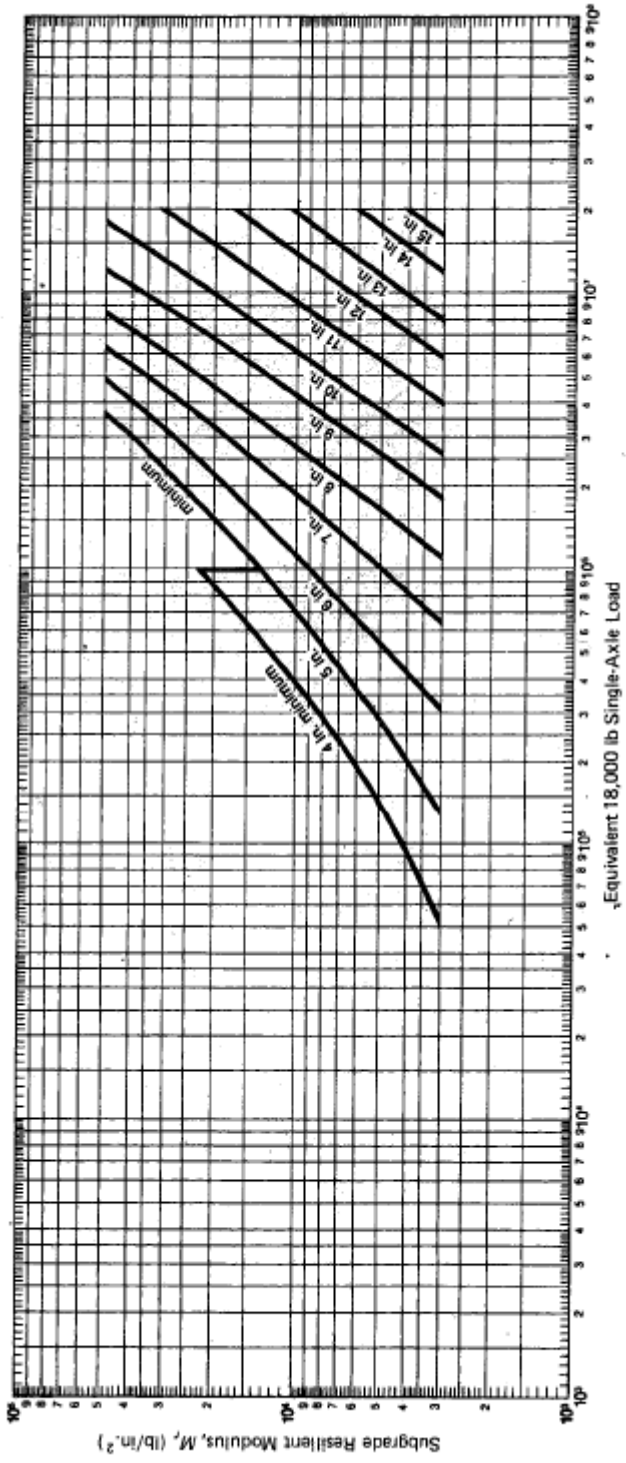
Source: Reproduced from *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, The Asphalt Institute, College Park, Md., September 1981.

المخطط (4)



Source: Reproduced from *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, The Asphalt Institute, College Park, Md., September 1981.

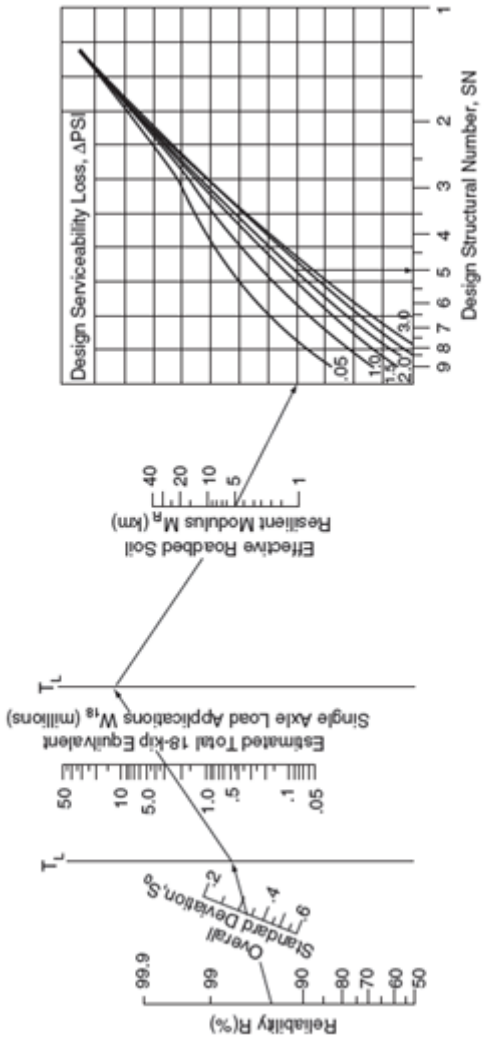
المخطط (5)



Design Chart for Pavements with Asphalt Concrete Surface and Untreated Aggregate Base 18 in. Thick

Source: Reproduced from *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, The Asphalt Institute, College Park, Md., September 1981.

ملحق (2) مخطط التصميم بطريقة أشتو AASHTO:



Design chart for flexible pavements based on using mean values for each input (AASHTO, 1993).

ملحق (3) مخططات التصميم بطريقة المزكرة البريطانية رقم (31):

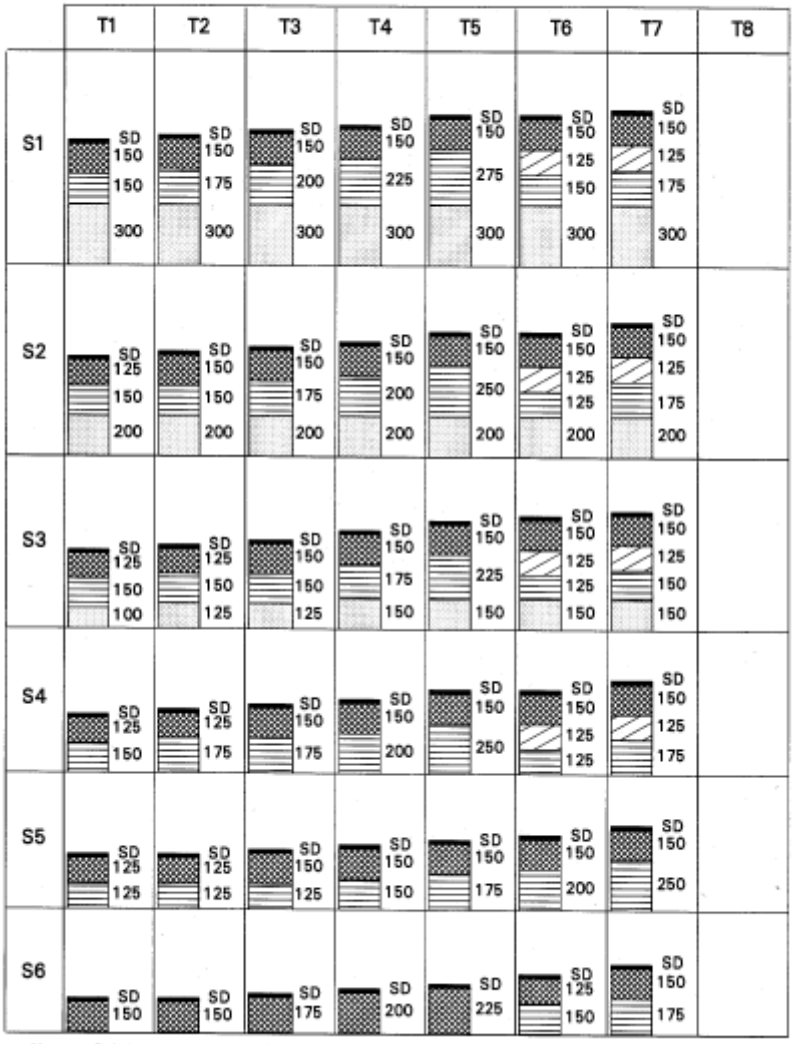
CHART 1 GRANULAR ROADBASE / SURFACE DRESSING

	T1	T2	T3	T4	T5	T6	T7	T8
S1	SD 150 / 175 / 300	SD 150 / 225* / 300	SD 200 / 200 / 300	SD 200 / 250* / 300	SD 200 / 300* / 300	SD 225 / 325* / 300		
S2	SD 150 / 150 / 200	SD 150 / 200 / 200	SD 200 / 175 / 200	SD 200 / 225* / 200	SD 200 / 275* / 200	SD 225 / 300* / 200		
S3	SD 150 / 200	SD 150 / 250	SD 200 / 225	SD 200 / 275*	SD 200 / 325*	SD 225 / 350*		
S4	SD 150 / 125	SD 150 / 175	SD 200 / 150	SD 200 / 200	SD 200 / 250	SD 225 / 275		
S5	SD 150 / 100	SD 150 / 100	SD 175 / 100	SD 200 / 125	SD 225 / 150	SD 250 / 175		
S6	SD 150	SD 150	SD 175	SD 200	SD 225	SD 250		

Note: 1 * Up to 100mm of sub-base may be substituted with selected fill provided the sub-base is not reduced to less than the roadbase thickness or 200mm whichever is the greater. The substitution ratio of sub-base to selected fill is 25mm : 32mm.

2 A cement or lime-stabilised sub-base may also be used.

CHART 2 COMPOSITE ROAD BASE (UNBOUND & CEMENTED) / SURFACE DRESSING



Note: Sub-base to fill substitution not permitted.

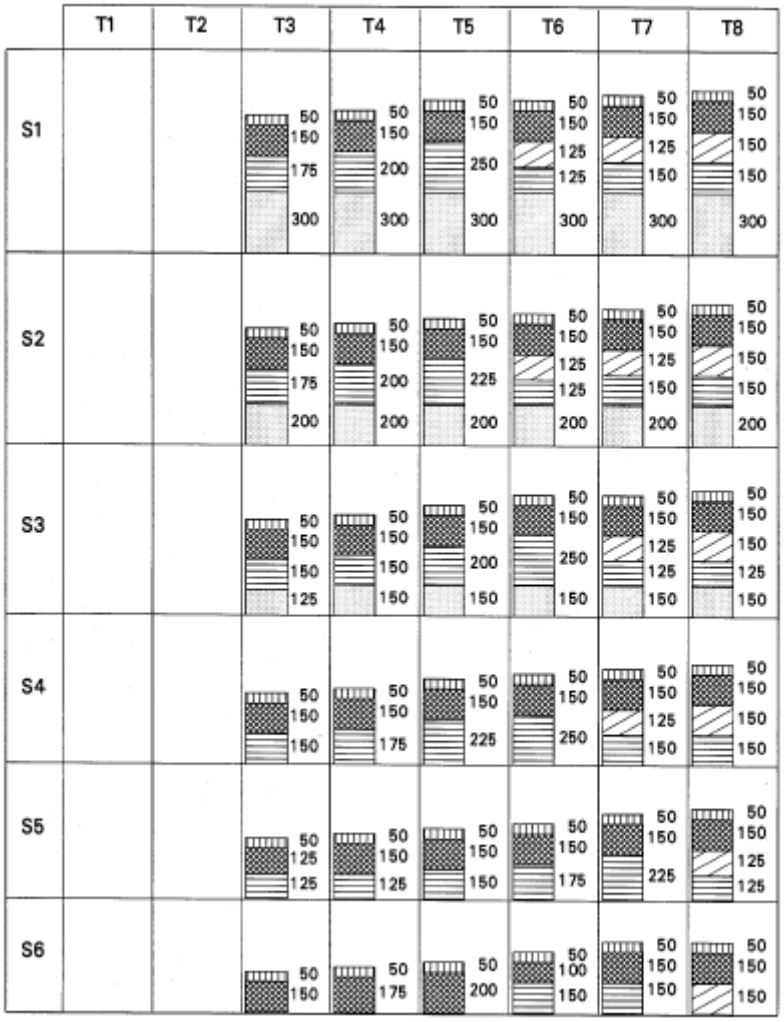
CHART 3 GRANULAR ROADBASE / SEMI-STRUCTURAL SURFACE

	T1	T2	T3	T4	T5	T6	T7	T8
S1			50 175 200 300	50 175 250* 300	50 175 300* 300	50 200 325* 300		
S2			50 175 175 200	50 175 225* 200	50 175 275* 200	50 200 300* 200		
S3			50 175 225	50 175 275*	50 175 325*	50 200 350*		
S4			50 175 150	50 175 200	50 175 250	50 200 275*		
S5			50 150 100	50 175 125	50 175 150	50 200 175		
S6			50 150	50 175	50 200	50 225		

Note: 1 * Up to 100mm of sub-base may be substituted with selected fill provided the sub-base is not reduced to less than the roadbase thickness or 200mm whichever is the greater. The substitution ratio of sub-base to selected fill is 25mm : 32mm.

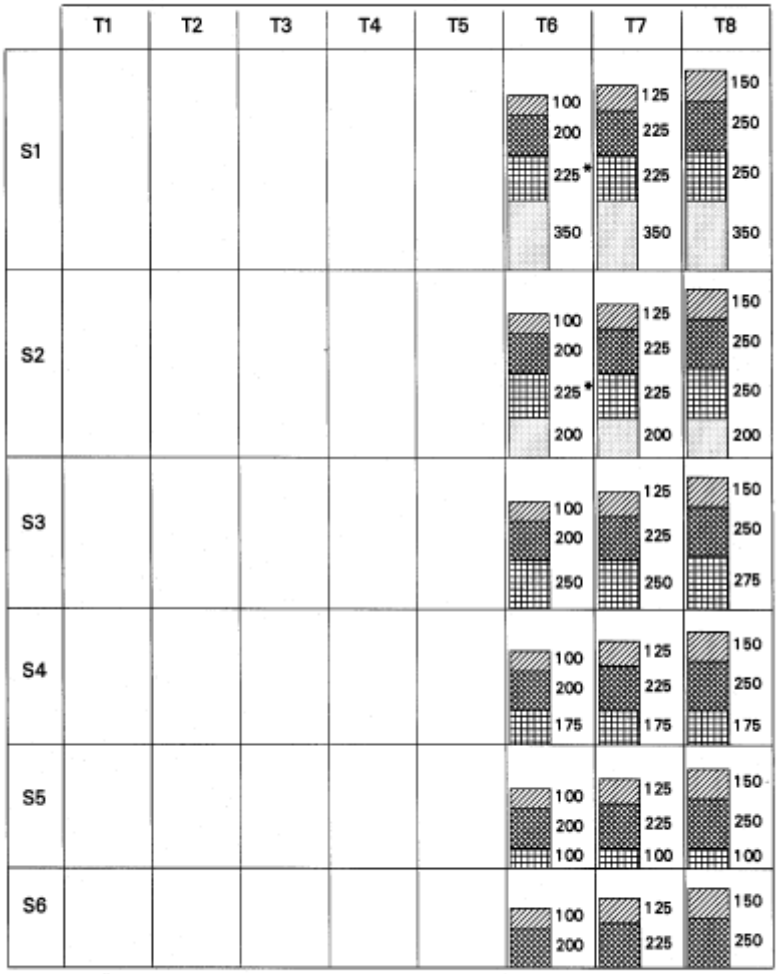
2 A cement or lime-stabilised sub-base may also be used.

CHART 4 COMPOSITE ROADBASE / SEMI - STRUCTURAL SURFACE



Note: Sub-base to fill substitution not permitted.

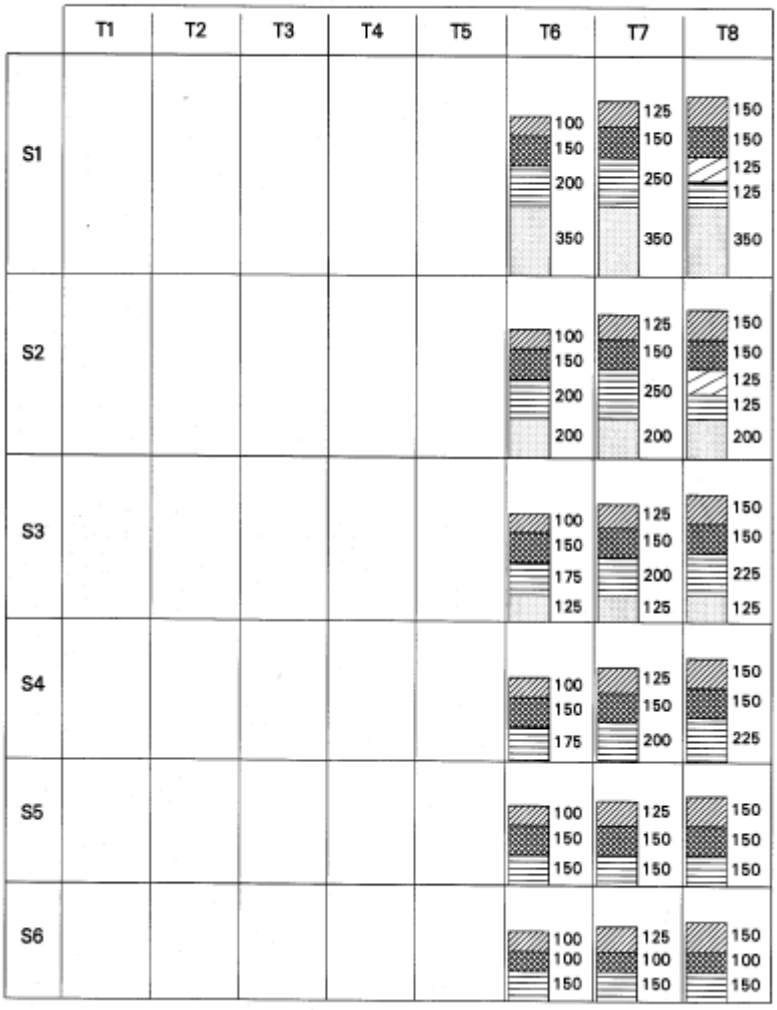
CHART 5 GRANULAR ROADBASE / STRUCTURAL SURFACE



Note: 1 * Up to 100mm of sub-base may be substituted with selected fill provided the sub-base is not reduced to less than the roadbase thickness or 200mm whichever is the greater. The substitution ratio of sub-base to selected fill is 25mm : 32mm.

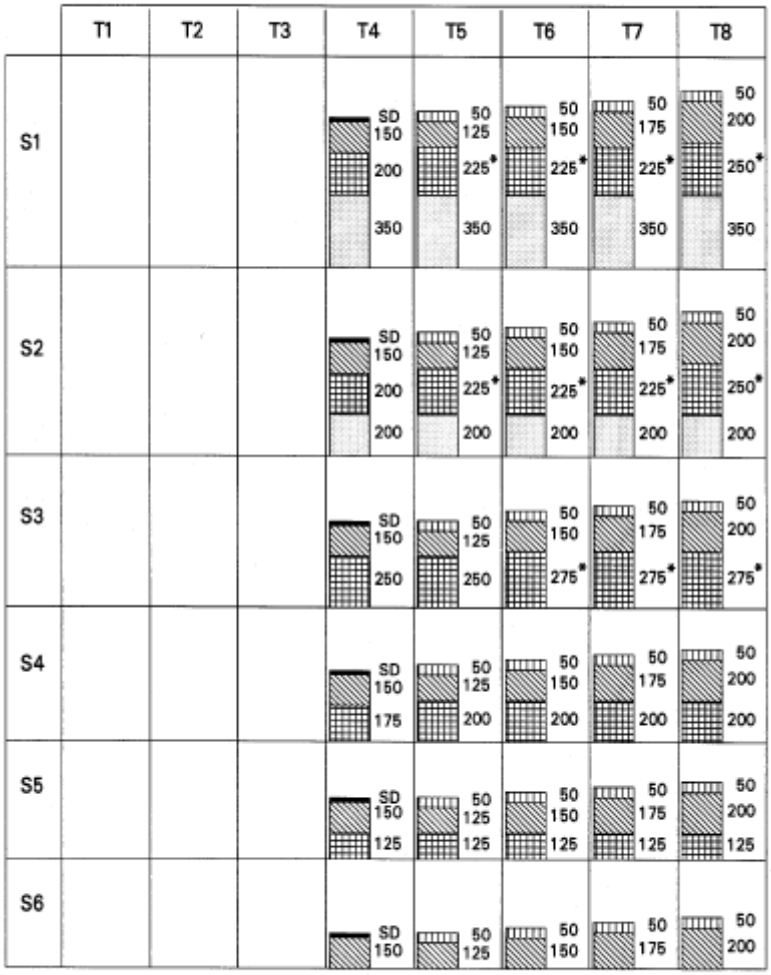
2 A cement or lime-stabilised sub-base may also be used.

CHART 6 COMPOSITE ROADBASE / STRUCTURAL SURFACE



Note: Sub-base to fill substitution not permitted.

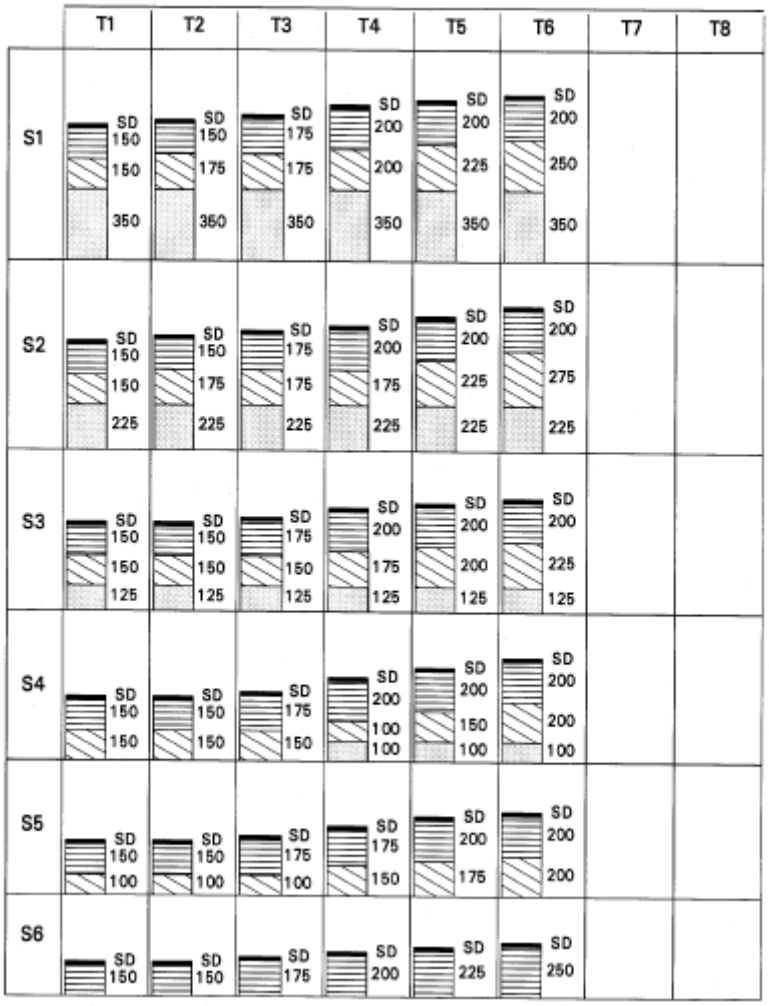
CHART 7 BITUMINOUS ROADBASE / SEMI-STRUCTURAL SURFACE



Note: 1 * Up to 100mm of sub-base may be substituted with selected fill provided the sub-base is not reduced to less than the roadbase thickness or 200mm whichever is the greater. The substitution ratio of sub-base to selected fill is 25mm : 32mm.

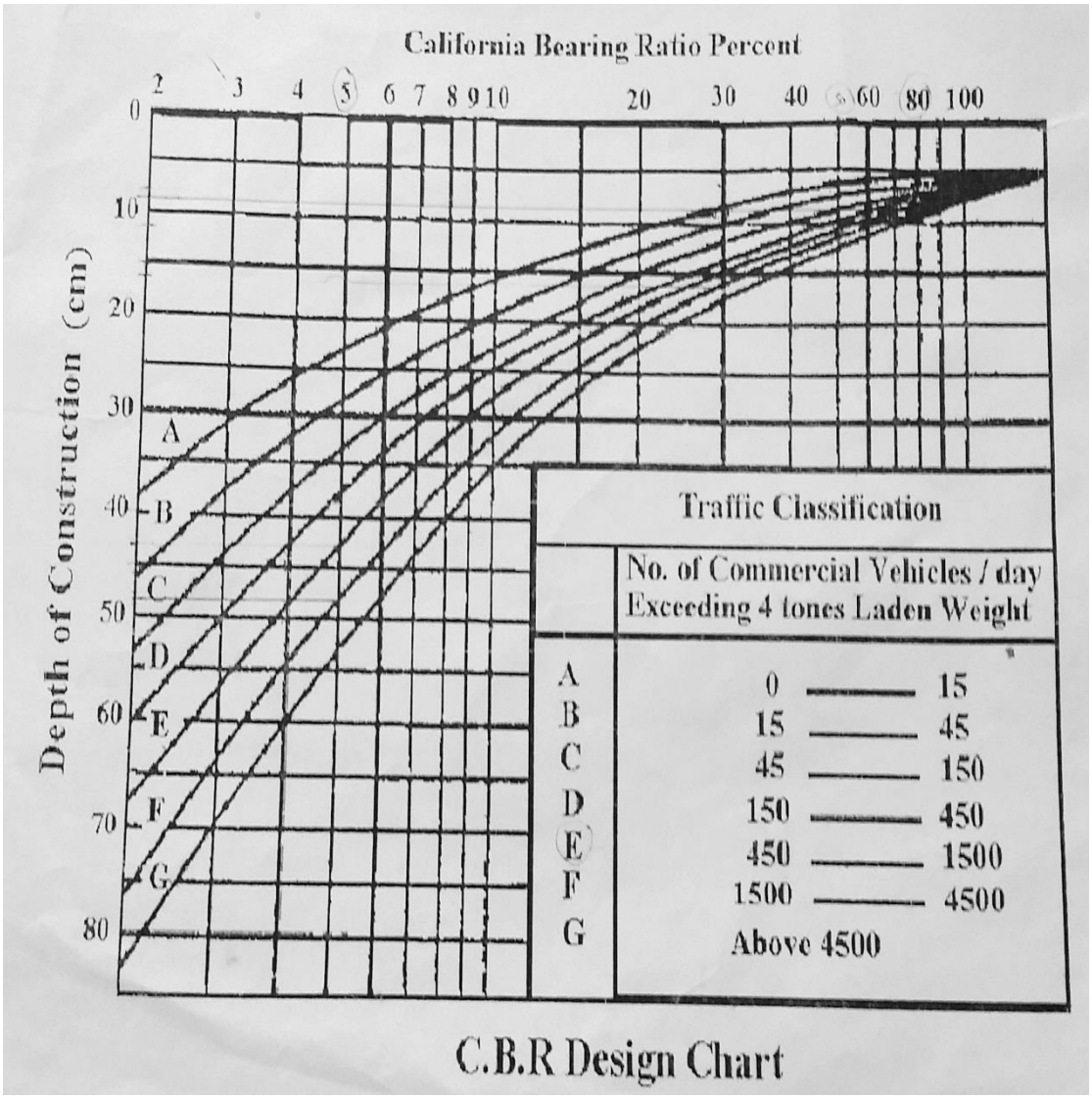
2 A cement or lime-stabilised sub-base may also be used but see Section 7.7.2.

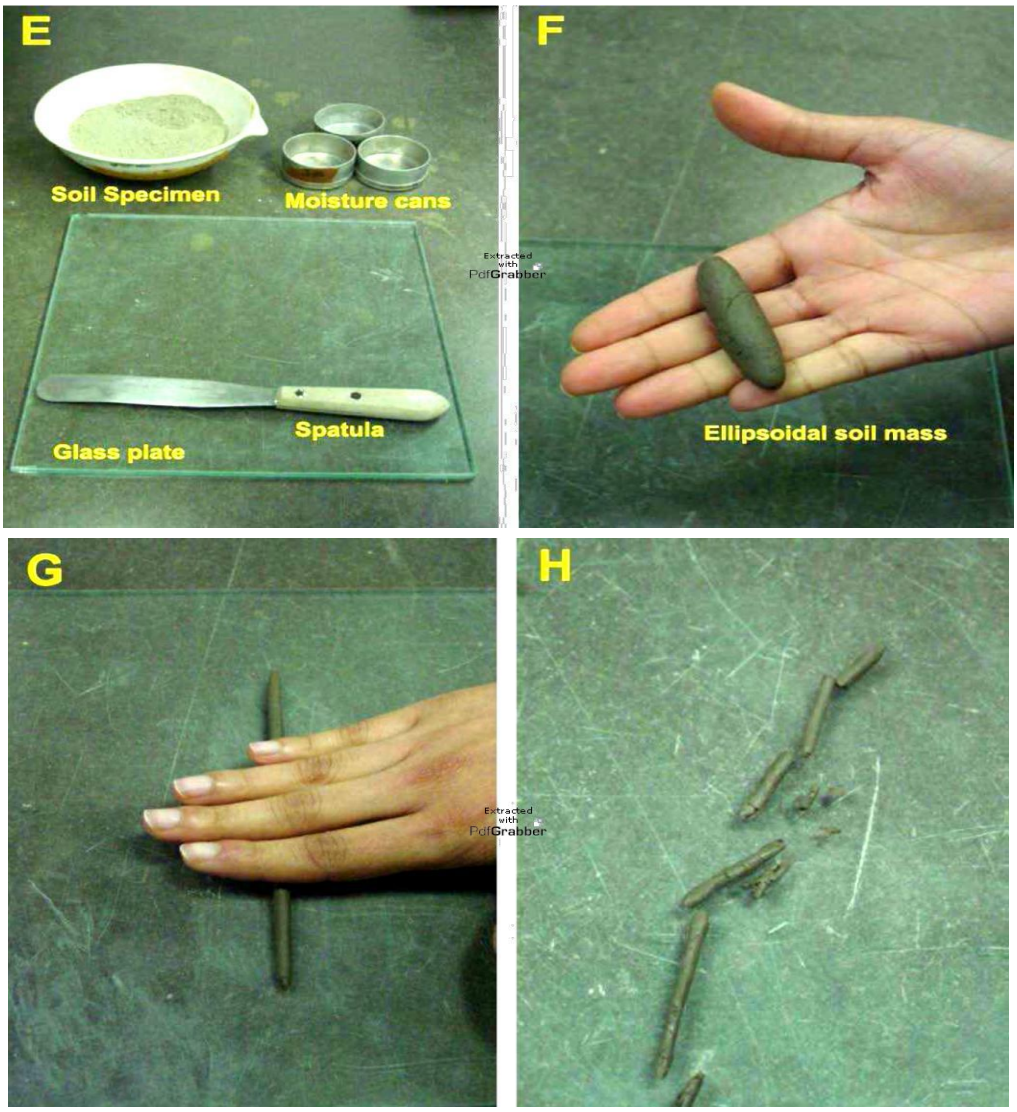
CHART 8 CEMENTED ROADBASE / SURFACE DRESSING



Note: A granular sub-base may also be used.

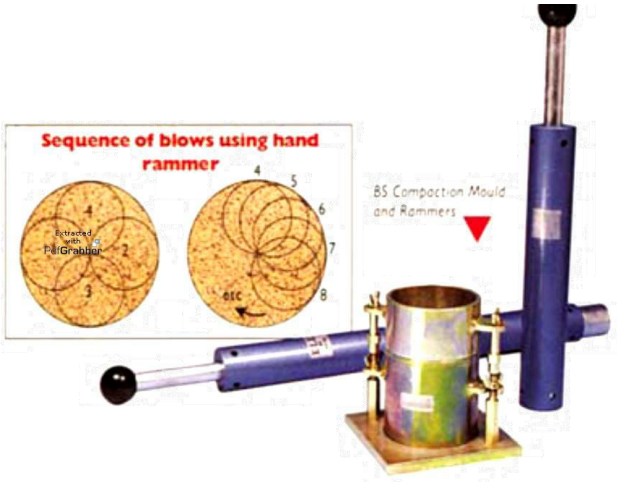
ملحق (4) مخطط التصميم بطريقة ال CBR :

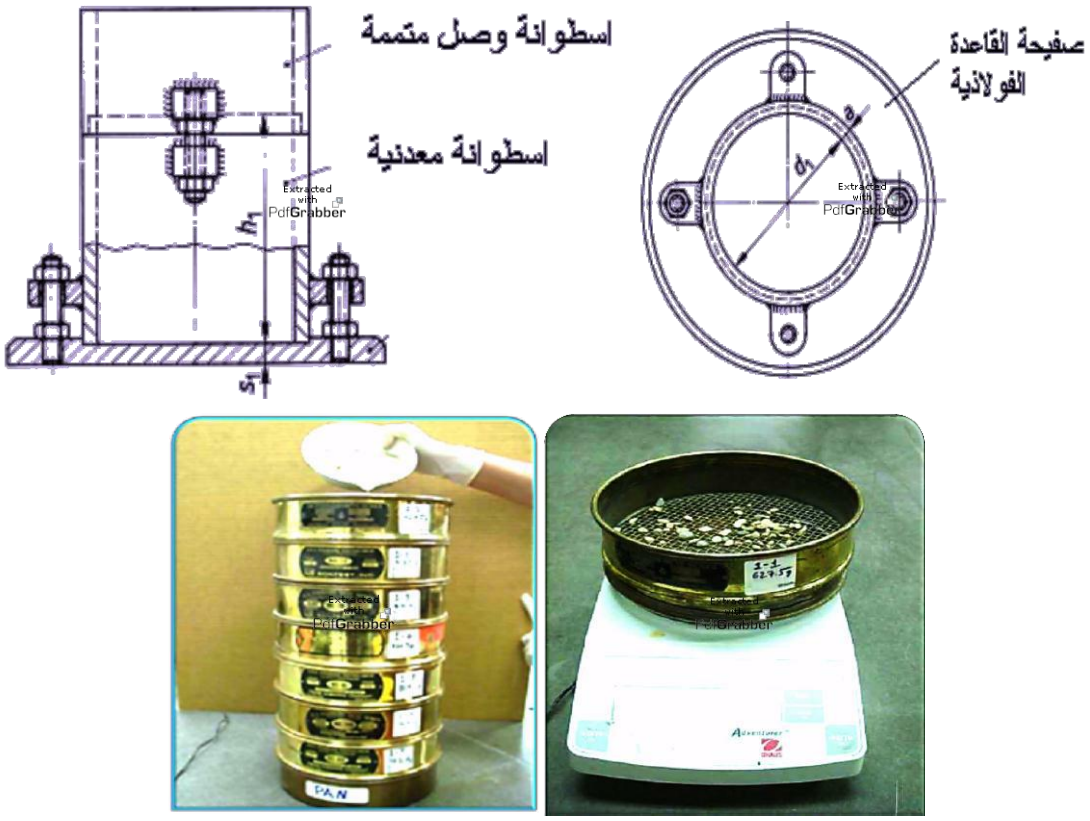




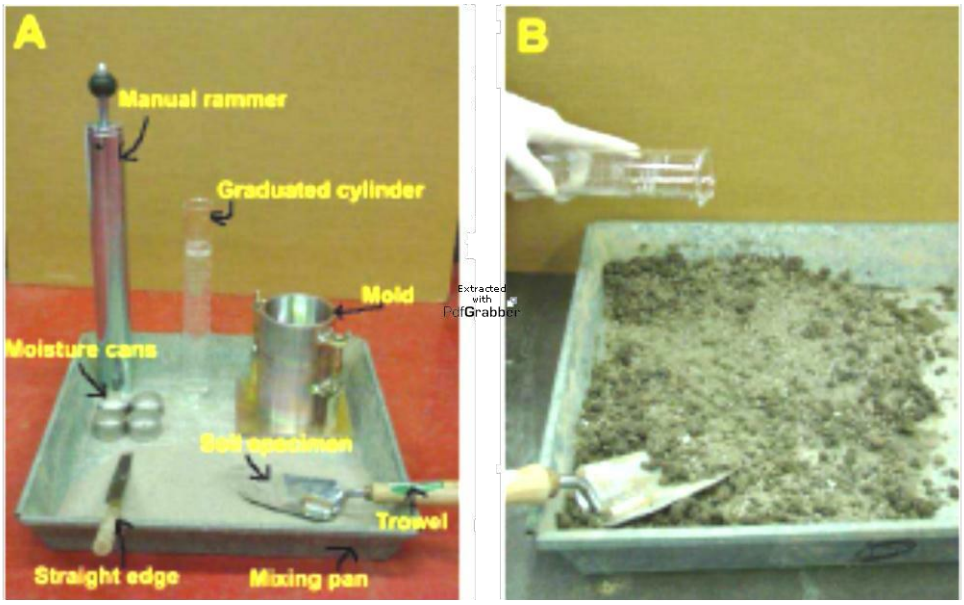
شكل(4.2) خطوات تجربة حد اللدونة

○





شكل (4.3) يوضح المعدات المستخدمة في تجربة الدمك



شكل(4.4) يوضح خطوات تجربة بركتور

شكل(4.5) صورة جهاز التحميل CBR

شكل(4.6) صورة القالب الاسطواني CBR