AFCESA-APE-532

AIRFIELD PAVEMENT EVALUATION

Keesler Air Force Base
Mississippi

October 2000

AFCESA

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

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13. ABSTRACT *(Maximum 200 words)*

An Air Force Civil Engineer Support Agency pavement evaluation team conducted a structural airfield pavement evaluation of Keesler Air Force Base, Mississippi from 5 Sep to 15 Sep 2000. The purpose of the evaluation was to determine the structural capacity for each airfield feature. Testing methods included the heavy weight deflectometer (HWD), dynamic cone penetrometer (DCP), hand auguring, a visual condition rating, and flexural strength testing of portland cement concrete (PCC) cores using the Free-Free Resonant Column test.

The range of surface conditions ratings was from EXCELLENT to VERY POOR

The following Pavements Classification Number (PCN) has been reported to the National Imagery and Mapping Agency to be reported in the FLIP:

Runway 03/21 27/F/B/W/T

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EXECUTIVE SUMMARY

At the request of HQ Air Education and Training Command (HQ AETC), four members from HQ Air Force Civil Engineer Support Agency (HQ AFCESA) conducted the field portion of an airfield pavement evaluation at Keesler AFB, Mississippi during the period 5 through 15 Sep 2000.

The objective of this evaluation is to determine the structural capacity of the airfield. This is accomplished by performing the following three tasks:

1. Determination of in-place physical properties of the pavement structure.
2. Computation of Allowable Gross Loads (AGLs) and Pavement Classification Numbers (PCNs) for those features.
3. Rating of the surface condition of each feature.

This final report provides background information, outlines field and laboratory test procedures, discusses test results, summarizes the surface condition, and details the structural capacity of individual pavement features.

Conclusions:

1. Structural Capacity: Keesler AFB primary airfield pavement is comprised of medium duty and light duty pavement. The medium duty pavement is of adequate strength with high AGLs for all Keesler mission and frequent transient aircraft. The light duty pavement is comprised of thin WW II vintage Portland Cement Concrete (PCC) and older thin Asphaltic Concrete (AC). These light duty pavements have adequate strength to support current use. No repair or reconstruction project is recommended solely on the basis of inadequate strength. The standard PCNs published in NIMA references for U S Air Force runways are based on the most restrictive primary runway feature for each runway and the C-17 aircraft at 50,000 passes. For Keesler AFB Runway 03/21 the PCN is 27/F/B/W/T.
2. Surface Condition: The surface condition observed at Keesler AFB ranged from EXCELLENT to VERY POOR. The majority of the primary pavements are in GOOD or better condition, and to the greatest extent, all primary pavements are serviceable. However, most GOOD and worse pavement are degrade and requires repair.

Recommendations:

1. **<u>Runway PCC Pavement:</u>** Execute minor repairs by patching the spalled areas and by replacing the failing patches. One transverse joint on the south overrun has opened up and needs to be re-sealed.
2. **<u>Runway AC Pavement:</u>** Mill and overlay the top 4” of the 75 foot keel of the interior and seal the cracks outside the interior keel and outside the overrun keel. Construct Feature R07C to greater strength
3. **<u>Runway Storm Drain Depression:</u>** In conjunction with the runway AC pavement reconstruction, material above and around the crossing large storm drain should be

excavated and re-compacted. Measures should be taken to prevent reoccurrence of subsidence.

4. **Taxiway "Alpha" AC & AC over PCC Features (T05A, T07A, and T08A):** Mill full depth of AC and replace. For areas with alligator cracking or depressions, reconstruct the base material. The depression associated with the storm drain crossing should be excavated full depth to the storm drain when reconstructed, measures should be taken to prevent reoccurrence. Construct T07A to greater strength.
5. **Taxiway "Charlie" (T03C):** Mill and overlay full depth of AC; certain areas require reconstruction of base material prior to overlay.
6. **Taxiway "Alpha" South (T01A):** Route and seal low severity cracks to prevent accelerated deterioration. Patch isolated points of higher distress and replace random slabs as condition requires. Keel replacement may be necessary 5 to 10 years in the future.
7. **AC Pavement Apron Features:** All AC pavement apron features are deteriorated to a state that all require mill and overlays. Isolated areas of alligator cracking and depressions require base reconstruction prior to placement of overlay. Prioritize, program, and executed projects based on use.
8. **Apron Feature A27B:** This pavement was separated from A18B as a unique feature due to concentrated distress. Execute project to reconstruct full depth.
9. **Apron Feature A07A:** Execute isolated patching and random slab replacement in the near term. Program Fiscal Year 2006 project to reconstruct full depth.
10. **PCC Apron Pavement of Original WW II Construction:** Execute project to patch spall, replace joint sealant, and replace random slabs with multiple cracks. Features A22C and A24C receive limited use and should receive less extensive, targeted repairs.
11. **Joint Sealant Distress:** Those areas identified with HIGH and/or MEDIUM distress level should be resealed as soon as practical.

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INTRODUCTION

Authority

At the request of HQ Air Education and Training Command (HQ AETC), four members from HQ Air Force Civil Engineer Support Agency (HQ AFCESA) conducted the field portion of an airfield pavement evaluation at Keesler AFB, Mississippi from 5 through 15 September 2000.

Objectives

The primary objectives of this evaluation are to:

1. Determine in-place physical properties of the pavement structure.
2. Compute Allowable Gross Loads (AGLs) and Pavement Classification Numbers (PCNs) for each feature.
3. Rate the surface condition of each feature.
4. Identify causes of pavement distresses and make subsequent recommendations for repair.

Potential Use of this Final Report

This report provides airfield pavement strength and condition information that can be used to manage and control an airfield system. Airfield managers and civil engineer personnel can use this report for the following purposes:

1. Determine the sizes, types, gear configuration, and gross weights of aircraft that can safely operate from a given pavement feature without damage to the pavements or aircraft.
2. Develop operations usage patterns for a particular airfield pavement system (e.g. parking plans, apron usage patterns, traffic flow).
3. Identify and predict major maintenance or repair requirements for an airfield to support present or proposed aircraft missions. When pavement rehabilitation is needed, this report can be used to furnish engineering data to aid in the project design.
4. Assist air base mission and contingency planning functions through the development of airfield layout and physical property data.
5. Develop and validate pavement system profile information.
6. Support programming documents that justify major pavement restoration projects.

Pavements Evaluated

This evaluation examined all airfield pavements at Keesler AFB. These pavements include Runways 03/21, a parallel taxiway, connecting taxiways, two warm-up aprons, two main parking aprons, a secondary parking apron, and hangar access aprons. As of September 2000, the Keesler AFB complex consisted of approximately 3.8 million square feet of pavements.

Description of Appendices

Many detailed appendices are used to report the information gathered during the evaluation. A description of each appendix is provided in Table 1 below.

Table 1--Description of Appendices

Appendix	Description
A	Airfield Drawings: Graphically depicts the different pavement features, designations, core and test locations, and surface condition of the airfield.
B	Field Test Data: Field coring log and Cursory Pavement Condition Rating.
C	Summary of Physical Property Data: Physical properties and elastic layer data of each pavement feature evaluated are tabulated in this appendix. Feature dimensions, material types, layer thicknesses, and engineering properties are included. Layered Elastic Model Data: Describes the properties of the model structure used to determine allowable loads and remaining life of the pavement system.
D	Allowable Gross Loads (AGLs): Lists the allowable loads at four pass intensity levels for each aircraft group for every feature.
E	Pavement Classification Number (PCN) Table: PCNs, a standardized method of reporting pavement strength, are shown for each feature.
F	Aircraft Classification Number (ACN) Charts: ACN charts for the 14 standard aircraft groups plus some additional aircraft are shown.
G	Related Data: Includes aircraft group indices, gross weight limits for each aircraft group, and pass intensity levels.

BACKGROUND INFORMATION

Location

Keesler Air Force Base is in Harris County, Mississippi, near the City of Biloxi. The base lies on relatively flat terrain. The field elevation is 34 feet above mean sea level and is geographically located near the Gulf of Mexico at 30° 25' North Latitude and 88° 55' West Longitude.

Construction History

The original airfield was constructed in the 1940's. Some of these WW II vintage pavements are still in use.

The was originally constructed in 1942. In 1973 the overruns were reconstructed to accept traffic and the thresholds were displaced. Certain runway pavements between the new touchdowns were reconstructed or overlaid. Mill and overlay, and other maintenance oriented projects were accomplished in the1970's through mid 1980's. Since the late 1980's, projects have been primarily limited to random slab replacement.

Many taxiway features were originally constructed in 1942 and 1953. For most of these pavements numerous Asphaltic Concrete (AC) overlay projects have been accomplished. In 1973 both far ends of the parallel taxiway were completely reconstructed; scope included construction of warm-up aprons.

Most primary apron features were originally constructed in the early 1940's. Many random slab projects have been accomplished; some areas have been overlaid with AC pavement prior to the late 1980's.

Climate

The geographic location of Keesler AFB has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. The average summer daily high temperature is in the low 90°s. Winters are mild, with only a rare cold wave that will normally moderate within 2 days. The average winter daily low temperature is in the low and mid 40°s. Precipitation is fairly heavy throughout the year; it peaks slightly in September. Average annual precipitation is 62 inches. Prolonged droughts are rare. Summer rain is often associated with thunderstorms. Climatic conditions are such that frost evaluation is not warranted.

Soil Conditions

In 1975 Soil Conservation Service (SCS) published a soil survey of Harris County, which includes relatively detailed mapping of the soil classifications for the soils found on the airfield. The specific named soils series mapped on the airfield are limited to Eustis Series and Harleston Series. Sandy silts (SM) and Silts (ML) dominate both of these series. This corresponded well with what was observed during this and previous evaluations.

These native soils represent subgrade conditions. In general, these are favorable soils for pavement application. However, compaction can be difficult during construction and sands are notorious for erosion and migration loss around storm sewers with open joints or fractures.

Aircraft Traffic

The primary aircraft operating at Keesler are C-130s and C-21s. C-9s and light trainers are common transient aircraft. The most significant portion of the traffic is the C-130 aircraft; 30 weekly passes can be expected (one pass Is equivalent to one take-off and landing - - - touch and go operations do not place significant load on the pavement).

Previous Evaluations

In February 1988, an Air Force Engineering and Services Center (AFESC) team published an airfield pavement evaluation. This team performed Falling Weight Deflectometer tests, extracted 84 Portland cement and asphaltic concrete cores, collected bulk samples, and performed a visual inspection of all airfield pavements.

In July 1976, an Air Force Civil Engineering Center (AFCEC) Pavement Evaluation Team published an airfield pavement evaluation. This team excavated 13 test pits, extracted approximately 125 Portland cement and asphaltic cores, and collected bulk samples.

Much of the background and historical data regarding this air base was taken directly from the previous reports described above.

TEST PROCEDURES

A variety of test methods were used, including the use of a falling weight deflectometer, a Dynamic Cone Penetrometer (DCP), a pavement coring drill, and completion of a pavement condition survey. All methods employed are nondestructive or semi-destructive, as opposed to the destructive test pits employed in past evaluations. A short description of the test methods follows:

Pavement Coring

Pavement coring is a vital part of the evaluation for three reasons. First, the cores are used to verify pavement thickness. Second, coring provides access to the underlying pavement layers for sampling and testing with other equipment, such as the DCP described below. Last, extracted Portland Cement Concrete (PCC) cores are tested to determine flexural strength.

Figure 1 shows a typical coring operation. Six-inch diameter diamond-tipped coring barrels are used to cut through both asphaltic concrete (AC) and PCC pavements. This type of pavement coring system is capable of cutting through pavements to depths of approximately 36 inches.

Figure 1-- Coring Operation

A total of 80 asphaltic concrete (AC) and PCC cores were extracted. At least one core was extracted from each airfield feature. Approximate core sample locations are shown in Appendix A. Figure 2 is a photograph of a typical core sample freshly extracted from an airfield pavement. Following any penetration testing and soil or base course sampling, base civil engineering personnel patched the core hole. PCC cores were field tested for flexural strength, or in certain cases shipped back to the AFCESA Pavements Laboratory to be tested by other methods.

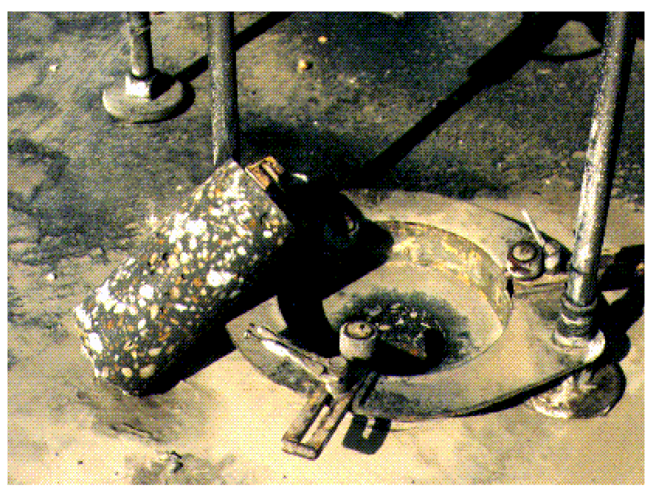

Figure 2--Typical PCC Core

Dynamic Cone Penetrometer

Twenty-seven DCP tests were conducted to measure the strength of underlying pavement and soil layers; results of twenty are included in Appendix B. The four main components of the DCP are the cone, the rod, the anvil, and the hammer. The cone is attached to one end of the DCP rod while the anvil and hammer are attached to the other end. Energy is applied to the cone tip through the rod by dropping the 8 kg hammer a distance of 575 mm against the anvil. The diameter of the cone is 4 mm larger than that of the rod to ensure that only tip resistance is measured. By recording the number of hammer blows it takes to advance the cone into the soil, the soil strength is quantified in terms of a DCP index. The DCP index is the ratio of the depth of penetration to the number of hammer blows and has been empirically correlated to the California Bearing Ratio (CBR).

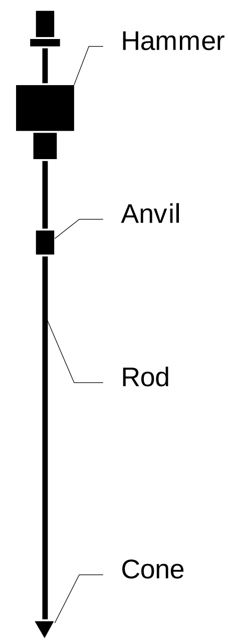

Figure 3--Dynamic Cone Penetrometer

Pavement Surface Condition

A cursory visual survey was conducted on all airfield pavements to rate the surface condition of each feature in terms of a Pavement Condition Index (PCI). This visual assessment was not as detailed as outlined in AFJMAN 32-1038; however, the pavements were categorized in general terms based on this guidance. Pavement condition ratings range from EXCELLENT (like new) to FAILED (unsafe for aircraft operations). *These ratings are a qualitative assessment of the pavement surface condition and should not be confused with the structural capacity of a pavement.* For example, a pavement surface may rate EXCELLENT but have underlying pavement or soil conditions that could result in pavement failure under the applied load of a given aircraft. On the other hand, a pavement may be structurally sound but the surface condition may be hazardous for aircraft traffic (e.g. FOD). The pavement condition rating scale used in this type of analysis is shown in Figure 4 and is described in more detail in Table 2.

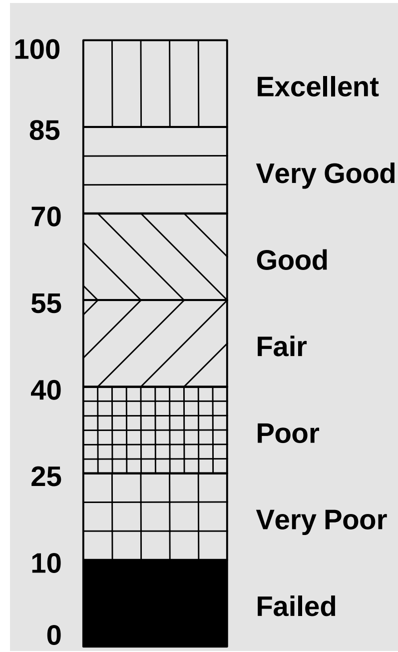

Figure 4--Pavement Surface Condition Rating Scale

Table 2--Definition of PCI Ratings

CONDITION	RATING	DEFINITION
EXCELLENT	86 - 100	Pavement has minor or no distresses and will require only routine maintenance.
VERY GOOD	71 - 85	Pavement has scattered low severity distresses which should need only routine maintenance.
GOOD	56 - 70	Pavement has a combination of generally low and medium severity distresses. Maintenance and repair needs should be routine to major in the near term.
FAIR	41 - 55	Pavement has low, medium, and high severity distresses which probably cause some operational problems. Maintenance and repair needs should range from routine to reconstruction in the near term.
POOR	26 - 40	Pavement has predominantly medium and high severity distresses causing considerable maintenance and operational problems. Near term maintenance and repair needs will be intensive.
VERY POOR	11 - 25	Pavement has mainly high severity distresses which cause operational restrictions. Repair needs are immediate.
FAILED	0 - 10	Pavement deterioration has progressed to the point that safe aircraft operations are no longer possible. Complete reconstruction is required.

It is important to monitor and track the surface condition of pavements to identify pavement problems early and plan appropriate repairs. A continual evaluation program can also help determine the most cost effective maintenance and repair action. Many pavement owners, such as cities, highway departments, and airports use the PCI scale as a means to program maintenance and repair spending. The owners establish one PCI threshold that triggers maintenance action, a second PCI level that triggers repair, and possibly a third that triggers reconstruction. This is based on the theory that the rate of deterioration of the surface condition increases as the pavement ages. This is best shown in Figure 5, where the curve of PCI vs. time rapidly drops as a pavement reaches over 50 percent of its original life span. By visualizing surface condition deterioration in this manner, the reader can see that the reported PCI indicates much more than a single number, but identifies the pavement's current stage in its life span. Maintenance activities are generally recommended for the pavements that rate VERY GOOD or EXCELLENT, where the cost is lower. If the owner waits until the pavement rates POOR to FAIR, the costs will far exceed routine maintenance, and some heavy repair may be required. This is obviously the more expensive option. Reconstruction is generally the only option for pavements rating VERY POOR to FAILED.

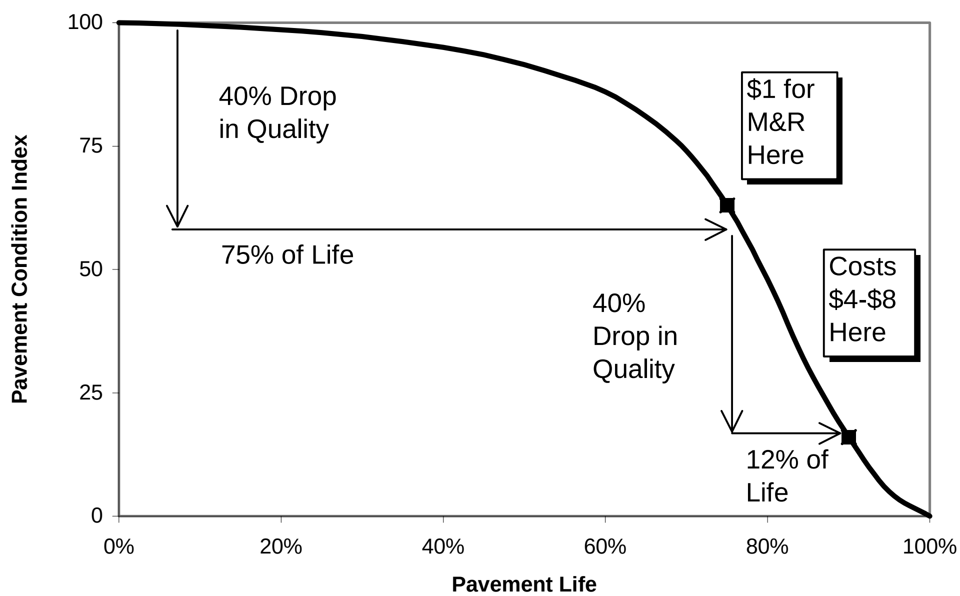

Figure 5--Typical Pavement Life Cycle (APWA,1983)

Of more direct impact to this structural evaluation, the value of completing the cursory PCI survey is three fold. First, it is a tool that helps identify potential structural problems. Second, for those pavements in POOR or worse condition, reported Allowable Gross Loads (AGLs) are reduced; therefore, to complete the structural analysis it must be determined whether any of the pavement features fall into those categories.

Third, in a subjective manner, the PCI survey can be used as a gage to determine if the pavement is approaching the end of its life. The AGLs at the various pass levels reported in the appendices do not take into account past aircraft traffic. If a pavement has a high density of structural distress concentrated on the traffic path, then it is conservative, and appropriate, to assume a substantial portion of the pavement life has been consumed. If such distresses are not present, it is appropriate to assume that significant pavement life remains, and, for that pass level which represents the long-term operations intensity for the airfield, the respective reported AGLs can be safely used for operations.

The cursory survey performed by AFCESA is also used to validate the in-depth PCI required every 5 years by AFI 32-1041 “Airfield Pavement Evaluation Program.” Paragraph A.2.14.5 of Attachment 2 to AFI 32-1032 requires airfield pavement projects to be developed using the Micropaver Pavement Maintenance Management System. The AFCESA survey does not detail the distress density that would be required in a full PCI survey and to perform analyses in Micropaver.

Heavy Weight Deflectometer (HWD) Testing

Nondestructive testing was accomplished on all features using the Dynatest 8081 Heavy Weight Deflectometer (HWD) illustrated in Figure 6.

The trailer-mounted HWD consists of a gravity driven impact load delivery system coupled to a deflection measurement package. The weight package is raised by an electro-

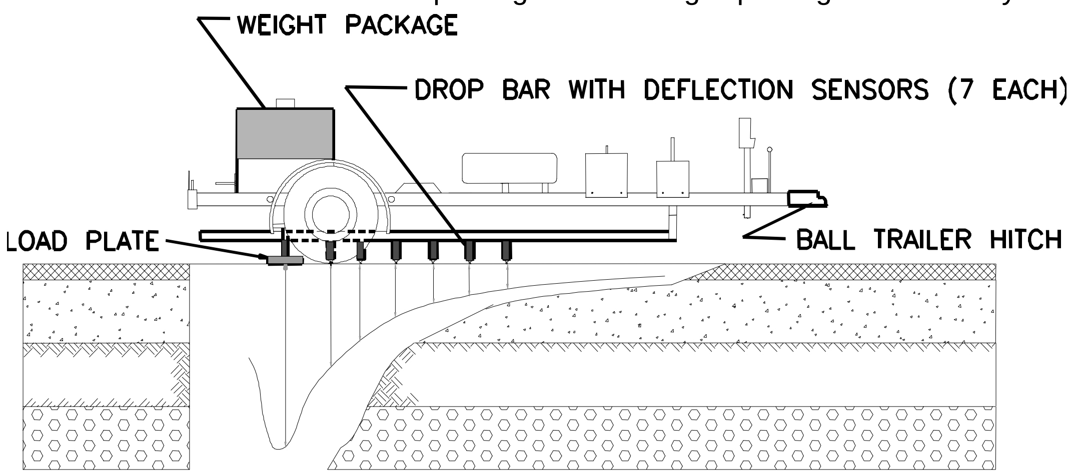

Figure 6--Heavy Weight Deflectometer and Deflection Basin

hydraulic servo system to the specified height and released. The load impacts an 11.8 inch diameter circular steel plate encased with a rubber pad. The result is a buffered load pulse with a duration of 0.025 to 0.030 seconds. By use of different drop weights and heights, the operator can vary the impact load imparted to the pavement structure within a range of 6,500 to 54,000 lbs. The deflection measurement package consists of seven velocity transducers in contact with the pavement surface and spaced at 12 inch intervals from the point of impact. An onboard computer records the deflection “basin” and provides the operator instantaneous deflection information. This raw data is automatically stored to disk for subsequent analysis.

Approximately 1000 HWD tests were performed at Keesler AFB. Results of these tests are used to determine engineering material properties of the pavement layers using layered elastic theory. In conjunction with aircraft load and landing gear characteristics, these properties are used to determine the Allowable Gross Loads (AGLs) and Pavement Classification Numbers (PCNs) for these airfield pavements.

PCC and Soil Testing

Flexural strengths of the PCC cores were primarily determined by resonant frequency methods. This procedure determines the resonant, or *natural*, frequency of the concrete following the standard procedure for determining longitudinal resonant frequencies using the impact resonance method (ASTM C215-97). Next, the resonant frequency is correlated to flexural strength. The test procedure and analysis are described in more detail below and depicted in Figure 7.

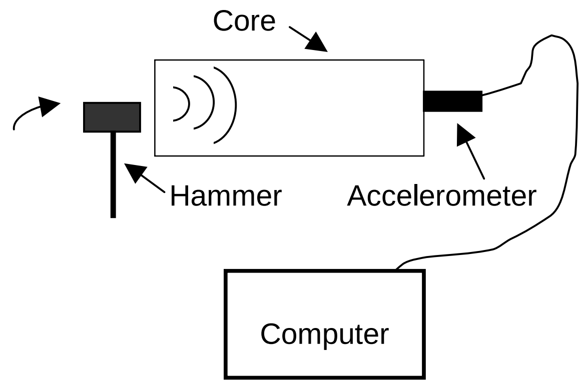

Figure 7--Free-Free Resonant Column Test

The PCC core is cleaned and scrubbed with a wire brush to remove any loose material. Any AC overlays and/or stabilized materials that may be attached to the PCC core are removed prior to testing. The core is placed on a piece of foam rubber on a vibration-free surface and an accelerometer is attached to one end of the core using modeling clay. The opposite end of the core is lightly tapped with a hammer. The accelerometer senses the vibration of the core and a computer records the motion. This motion is analyzed using a Fast Fourier Transform to determine the frequency components of the motion. The frequency with the greatest motion amplitude corresponds to the natural frequency.

Once the natural frequency, f_R, is known for a core of length L, the compression wave speed, V_p, can be calculated using the following relationship.

$$V_p = 2Lf_R$$

Next, the compression wave speed is converted to flexural strength, F, using a correlation determined from a laboratory study completed by the US Army Corps of Engineers' Waterways Experiment Station.

$$F = \left(0.0035 * V_p - 20.33\right)^2$$

This correlation was developed for cores with a length to diameter ratio of 2:1. Most cores collected from pavements do not have a 2:1 ratio of length to diameter; therefore, a correction factor is applied to adjust to the standard length. For a core length, L, and diameter, D, the corrected flex strength, F_c, is determined using the following formula.

$$F_c = \left(2.0 - L/D\right) * 40.3 + F$$

This test procedure has been more accurate and produced less scatter than split tensile testing. However, a few cores did not produce reasonable results. In those cases, the cores were tested using split-tensile procedures.

The split-tensile test is depicted in Figure 8. PCC cores were tested for strength by tensile splitting in accordance with standard practices. The core tensile strengths were then converted to flexural strengths using the following empirically developed relationship (WES, 1974).

$$f = \left[\frac{2p}{\pi \cdot ld} \right] 1.02 + 210$$

In this equation, f is the flexural strength (psi), p is the applied load (lb), and l and d are the length and diameter of the sample (in), respectively.

Bulk soil samples were also shipped to the AFCESA laboratory for testing. These samples under went sieve analysis and Atterberg limits testing to classify the soil in the Unified Soil Classification System.

Figure 8--Split Tensile Test

ANALYSIS

The Layered Elastic Evaluation Program (LEEP), written by the US Army Corps of Engineers, Engineering Research and Development Center (formerly Waterways Experiment Station), was used to determine layer moduli and allowable loads or passes to failure. This program uses a sub-module WESLEA to calculate stresses and strains in a layered linear-elastic system. The following assumptions are applied (Alexander, 1994):

- The pavement is a multi-layered structure, and each layer is represented by a modulus of elasticity and Poisson's ratio.
- The interface between layers is continuous: i.e., the frictional resistance between layers is greater than the developed shear force.
- The bottom layer is of infinite thickness.
- All loads are static, circular, and uniform over the contact area.

Failure Criteria

Failure criteria is the most important concept in pavement strength and remaining life evaluation. For allowable load pavement analysis, the failure criteria are different for rigid and flexible pavements. The failure criteria for rigid pavement systems is based on limiting tensile stress in the PCC layer. For flexible pavement systems, failure criteria is based on limiting tensile strain in the AC layer and limiting compressive (vertical) strain in the subgrade.

For the LEEP analysis, the pavement is considered failed when the structural Condition Index (SCI) drops to 50. The SCI is similar to the PCI, except only structural distresses (longitudinal cracks, corner breaks, etc.) are counted as deductions.

Parameters

The principal parameters used in determining Allowable Gross Loads (AGLs) are pavement and soils type, thickness, flexural strength (for PCC only) and modulus of elasticity. Results of field and laboratory tests are compiled in the Summary of Physical Property Data (PPD), found in Appendix C. In addition to displaying the details of material type, thickness, and strength for each pavement layer on the airfield, the PPD provides important corollary information such as feature dimensions and surface condition. The data presented here were selected as the most representative values of thickness and strength for each feature.

Pavement layer type and thickness are determined directly from the pavement coring process in the field. As described earlier, flexural strength is derived from laboratory tests.

The remaining unknown variable is the modulus of elasticity, which is back-calculated by computer using layered elastic theory. The computer assumes a modulus value for each layer in a modeled pavement system, and calculates surface deflections for that model for the same load applied in the field. The calculated deflections are compared to the actual measured deflections and new corrected modulus values are selected. This procedure is continued in an iterative fashion until the calculated surface deflections closely approximate the actual measured deflections. Modulus values for the modeled pavement system are then available for calculation of AGLs. The layered elastic model structures were used to determine AGLs and PCNs for Keesler AFB.

Determination of AGLs and PCNs

The calculation of AGLs and PCNs is performed by computer based on procedures in AFMAN 32-1121 (V1), Chapter 2. AGLs for airfield pavement features at Keesler AFB are listed in Appendix D. The Related Data in Appendix G are essential to understanding the AGLs reported in Appendix D. The different pass intensity levels, aircraft group indices, and gross weight limits for those aircraft groups are listed on this sheet. Note that for features rated POOR or worse, calculated AGLs are reduced by 25% due to poor load transfer and other empirical principles.

PCNs are tabulated on page E-1, and a PCN description key is on page E-2. Additional information regarding the use of the ACN/PCN system is found later in this report. The governing PCN which is listed on the report documentation page is defined as the weakest feature along the central portion (keel) of a runway from threshold to threshold. It also includes the entire width of the touch down zones. Overruns and the non-keel pavements of the runway interior are excluded under this definition.

RESULTS

Field Tests

All field test results are summarized in Appendices A through C. Appendix A contains the Core Location Plan and Appendix B contains the Core Log and lists the flexural strengths determined for the extracted cores. Results from the Cursory PCI Survey are also shown in Appendix B. For features not directly sampled or tested, strength parameters were taken directly from previous pavement evaluation reports. The Summary of Physical Property Data in Appendix C shows the layer thicknesses and strengths determined from the DCP data. The PPD table represents a snapshot of the actual physical pavement structure as of September 2000, when the field-testing was performed.

Laboratory Tests

All PCC core samples were tested to determine flexural strength. The flexural strength is an important input variable into the calculation of allowable gross loads. To be conservative, the flexural strength at Keesler AFB was capped at 800 psi and is the highest value shown in the physical property data.

The split tensile testing process provides an excellent opportunity to observe distresses internal to the PCC structure. If a concrete pavement is suffering from alkali-silica reaction (ASR), excessive air voids in the mix, or aggregate gradation/quality problems, these flaws will be observed as the concrete cores are split open. No notable defects were noted in those cores subjected to split tensile testing.

A modest number of base and subgrade soil samples were formally classified in the laboratory. The results are included in Appendix C as part of the Summary of Physical Properties Data (PPD). Those soil classifications not noted as being sourced from prior reports are the results of these recent tests.

Pavement Surface Condition

The surface condition observed at Keesler AFB ranged from EXCELLENT to VERY POOR. Appendix B shows a summary of the distress types and severity levels observed; density is not reported. The Airfield Layout in Appendix A shows the location of the pavement features identified in the table. The Pavement Condition map (Appendix A) designates the surface condition rating assigned to each feature. The reader is referred to Air Force Joint Manual 32-1038 for descriptions and exact definitions of the types and severity levels of the distresses listed below.

The following paragraphs describe the observed surface condition of the airfield pavements at Keesler AFB.

Runways

Keesler AFB's single runway, Runway 03/21, is constructed of both PCC and AC pavements. The touchdown landing zones and trafficked portions of the overruns are constructed of PCC. During take-off operations, thresholds are displaced on the primary end such that pavements that would normally be considered as overruns are trafficked. The runway interior and the non-trafficked outer edge pavement of the overruns are constructed of AC. All PCC pavement features are either in EXCELLENT or VERY GOOD condition and all such features have the same type and similar density of distresses. All AC pavement features are in GOOD condition, and similarly AC features are consistent with respect to the distresses present.

Spalling around the perimeter of the slabs, though at a low density, is the most common PCC distress. Figure 9 shows typical spalling and Figure 10 shows a distressed patch, which was originally placed to repair a corner spall.

As shown in Figure 11, longitudinal cracking following the seam between paving lanes have most significant distress. These cracks are generally in good condition and are not generating FOD. Some longitudinal cracks are classified as medium severity due to the unsealed crack width. Sealing these cracks would reduce the severity category to low because the infiltration of water would be prevented. Block cracking and raveling are also wide spread distresses, yet both are primarily of low severity. Block cracking on the runway is similar to that shown below in the discussion of the taxiways, but is not as advanced. Raveling is the weathering away of surface binder and aggregate. This distress is common to all the AC pavement at Keesler AFB due to age, but on the runway raveling is less severe than elsewhere on the airfield. Figure 12 shows the top section of an AC core sample taken over a longitudinal crack. This crack went through the full depth of the top 4 inches of the most recent overlay, but did not continue through the lower AC layers. Throughout most of the length of the runway interior, the total thickness of the AC is 9 inches or greater. Proper overlay repair would require milling down and replacing the top 4 inches.

A large storm drain cross the airfield. It crosses the runway through Feature R07C. As shown in Figure 13, a wide depression (partially filled by patching) is present at this location. This most likely cause of this subsidence is the loss of subgrade material through joints or other openings of the storm drain.

Taxiways

The Keesler AFB taxiway system consists of a primary parallel taxiway, ladder taxiways accessing the runways, and a secondary taxiway providing access to an overflow parking apron. The north and south portion of the primary taxiway, including the south portion of Taxiway “Alpha” and Taxiways “Bravo” and “Foxtrot” are of PCC construction and in GOOD and Excellent condition. All other taxiways are constructed of AC and range from VERY GOOD to POOR condition.

Minor distresses common to the runway PCC pavement are present at a similar density within the taxiway PCC pavement. On the PCC portion of Taxiway “Alpha” (T01A) near Taxiway “Charlie”, a significant number of slabs have longitudinal cracks. Many of these slabs have been replaced, and then subsequently cracks have formed in many of the replacement slabs. A Portland Cement (PC) stabilized sand-shell base is present directly beneath the PCC slab for all of the PCC construction of 1973. This stabilized material is high quality and in some respects has properties that resembles the rigid properties of PCC. Prior to the slab replacement, the crack in the original slab would have extended down through the stabilized base. The stabilized base appears to be the same under both the replacement and original slabs, and if in fact the stabilized base was not fully reconstructed with the replacement slab, the crack in the original stabilized base would reflect back up though the replacement slab. Figure 14 shows one of the more severe longitudinal cracks; Figure 15 shows a typical sample of PC stabilized base. Localized subsidence at the pavement edge above a storm drain was observed in this area (Figure 16); HWD response indicated that this subsidence may persist under the slabs.

The parallel Taxiway “Alpha” is comprised of the PCC pavement, discussed above, and three other features to the north. This balance of “Alpha” is comprises of a section of PCC overlaid with AC (T05A) and a section of AC pavement (T07A and T08A). The overlaid section is in GOOD condition and the conventional AC section is in FAIR condition. Feature 17 shows the overlaid section. The dominate distress is medium and higher severity reflective cracking, which are cracks originating from the underlying PCC joints and cracks that have reflected up through the full depth of the AC. The conventional AC features are dominated by medium and higher severity block cracking with localized areas of medium severity alligator cracking and depressions. The alligator cracking and depressions are associated with a failure of the base material. Figure 18 shows an area of alligator cracking; block cracking can also be observed in this photograph. Figure 19 shows a core taken over a typical block crack and shows that the crack has propagated full depth. Due to the cracks having penetrated full depth of the AC for both the overlaid and conventional section, proper repair would require full depth replacement of the AC layer. Areas with depressions and alligator cracking will require reconstruction of the base material. The settlement associated with the storm sewer noted in the above runway discussion is also associated with Feature T07A; similar reconstruction is required.

Two secondary taxiway features, T03C and T10C, are in POOR condition. Feature T03C is part of Taxiway “Charlie” and Feature T10C is the taxi-lane on the overflow parking apron. Figure 20 shows typical high severity block cracking and localized alligator cracking.

Aprons

Keesler Air Force Base apron pavement consists of two main aprons, a secondary overflow apron, and aprons associated with hangars. The two main aprons include a large apron facing Taxiway "Alpha" and a large maintenance apron south of the tower that extends to the east.

Feature A10B is a major portion of the maintenance apron and is in GOOD condition. The dominate distresses are longitudinal cracks, large patches (replacement slabs), and high severity joint sealant distress. This feature is much more serviceable than one would expect from a GOOD pavement. Replacement slabs are performing well and longitudinal cracking is caused by the rectangular shape of the slabs rather than load related stress. Figure 21 shows both typical replacement slabs and longitudinally crack original slabs.

Features A06B, A07A, and A18B are old WW II PCC that has been overlaid with PCC in the mid 1970's. A06B and A18B are in VERY GOOD condition and A07A is in GOOD condition. The most noteworthy distresses are cracks reflecting up from the underlying WW II PCC. In areas of low traffic, these cracks are of low severity as shown in Figure 22. Feature A07A receives channelized traffic and has degraded to only GOOD condition. Figure 23 and Figure 24 show cracks of higher severity located in Feature A07A.

Channelized traffic at Parking Spot 12 has caused a concentrated area of distress on what used to be the far north region of Feature A18B. Due to the distress concentration, this area was identified as a separate feature, Feature A27B. This feature is in VERY POOR condition. Figure 25 shows shattered slabs of this feature. Also noteworthy, a void was discovered with the DCP in the south wing-tip area, which may be a factor causing the degradation. Noteworthy, in general with respect to all the PCC overlaid WW II PCC pavement, is the bond quality between the layers observed in the core samples; about half were well bonded and the other half were not bonded at all. Bonding may have been difficult to achieve due to condition of the underlying slabs.

The AC overlaid sections of PCC apron pavements (A08B, A06B, A17B, and A19B) are in GOOD condition and have distresses typical to those associated with FeatureT05A of Taxiway "Alpha"

The AC pavement comprising the overflow apron, Feature A02B, is in POOR condition. As with the features discussed above, this feature has distresses that are consistent with similar taxiway feature (T10C) previously discussed.

Features A22C and A24C are hangar aprons of WW II construction. Feature A22C is in POOR condition and Feature A24C is in FAIR condition. Joint sealant distress is high and cracks have advanced to a high severity level such that patching and slab replacement is warranted. These pavements are only used by towed C-21s; this limited use mitigates concern and may justify limited repairs. Figure 26 shows shattered slab located within Feature A22C.

Figure 9--Runway Corner Spall

Figure 10--Runway Spall Patch

Figure 11--Runway AC Longitudinal Crack

Figure 12--Runway AC Core

Figure 13--Subsidence on Runway

Figure 14--Taxiway "Alpha" Longitudinal Crack

Figure 15--Stabilized Base

Figure 16--Taxiway "Alpha" Subsidence

Figure 17--Taxiway "Alpha" Reflective Cracks

Figure 18--Taxiway "Alpha" Alligator Cracking and Depression

Figure 19--Taxiway "Alpha" Core

Figure 20--Overflow Apron Taxiway AC

Figure 21--Feature A10B Replacement Slabs and Cracked Original Slabs

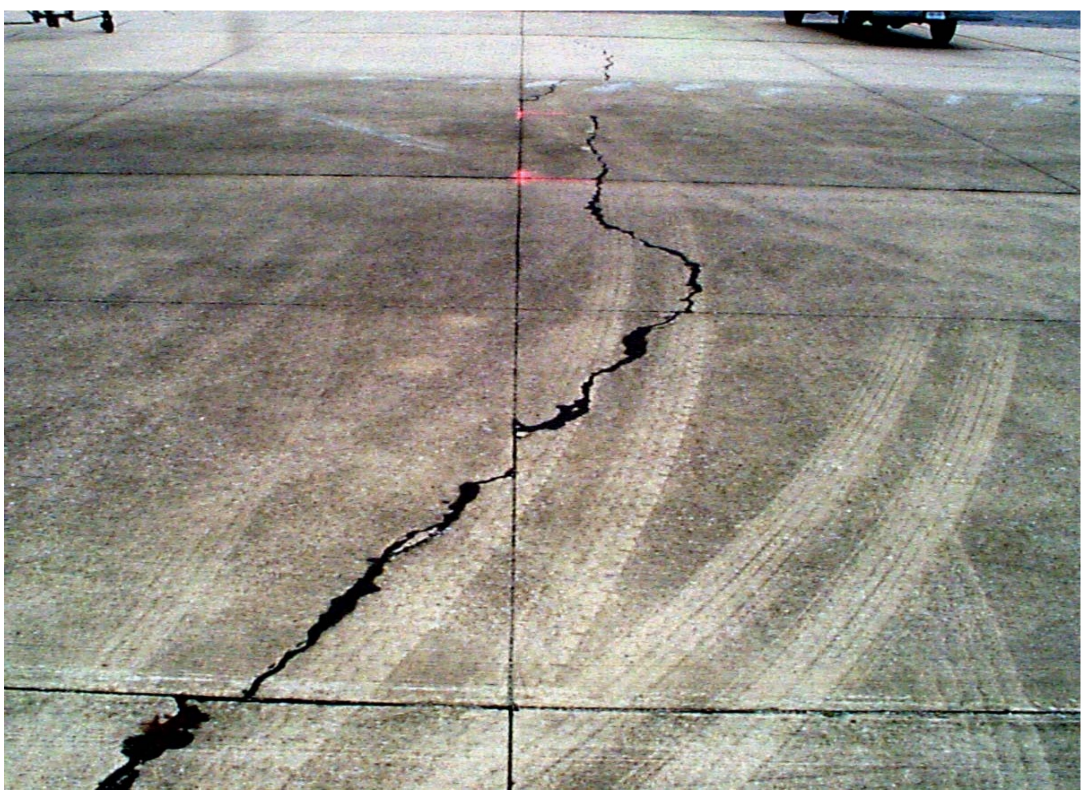

Figure 22--PCC Transverse Crack Reflected From Underlying Slab

Figure 23--Reflected Crack; Feature A07A

Figure 24--Reflected Crack; Feature A07A

Figure 25--Failed Slabs at Parking Spot 12

Figure 26--Shattered Slab in Feature A22C

Pavement Structural Capacity

Allowable gross loads (AGLs) were calculated for each pavement feature using computer models as described in the previous section. Structural data was determined for each feature from Dynamic Cone Penetrometer and Heavy-Weight Deflectometer tests. Allowable loads for each feature are published in Appendix D. Consult the next section of this report for specific instructions and examples of using the AGL tables to make operational decisions.

The Air Force standard model for reporting PCNs is 50,000 passes of a C-17. This is because the C-17 is going to be the primary heavy cargo aircraft for the Air Force well into the future. So, often for general purposes it is good to examine AGLs in terms of C-17 capability. But it is also useful to examine critical or weak features with respect to local aircraft, such as the C-130. The examples in the following section examine the most restrictive runway feature, Feature A12A.

USING THE STRUCTURAL RESULTS OF THIS REPORT

Allowable Gross Load Method

AGLs represent a condition of failure at a specified Pass Intensity Level. Theoretically, if aircraft of a *single aircraft group* operate at the *specified AGL* for the *specified number of passes*, the pavement feature will fail as the last aircraft passes. This artificial situation will never exist at Air Force installations operating a variety of aircraft types at a wide range of operating weights; however, it is important to understand that AGLs are determined based on a condition of failure as described above.

Occasionally, it may be necessary to operate an aircraft on a given pavement feature at a weight that exceeds the AGL. Overloading the pavement in an isolated instance will not necessarily cause a catastrophic failure, but the pavement engineer must be aware that there will be some reduction in pavement life. Most pavements are subjected to many different types of aircraft, at various weights, and each one has its own unique impact on pavement life. When evaluating how much life a pavement feature has left, the engineer must consider the current pavement condition, all of the aircraft types that will use the pavement, and the previous aircraft traffic. Each AGL is based on the assumption that all of the pavement life is used by that one aircraft type. When several different aircraft use the airfield, each aircraft type uses a portion of the pavement life, and the combined effect on pavement life from all aircraft must be taken into account.

The tabulated AGLs in Appendix D are reported for four different pass levels, each of which represents a specific number of passes. A simple example of how the AGL tables can be used to determine the allowable gross load for a number of passes other than one of the standard pass levels is shown below. Also shown as an example, the number of passes until failure can be predicted for a given aircraft weight.

Example 1

Problem: (a) Determine the allowable number of passes for a C-130 operating at 145 kips for Feature R07C. (b) What is the maximum load for 20,000 passes of a C-130 for Feature R07C?

Solution: The first step is to capture the AGLs for R07C from Appendix D. From the Related Data Table in Appendix G one can see that the C-130 is in Aircraft Group 4. Next, scan the AGL table in Appendix D to find the AGLs for Group 4 aircraft for Feature R07C. The AGLs for this feature are shown below. Finally, create a graph plotting the AGL on the vertical axis and the Allowable Passes on the horizontal axis.

Number of Passes	*Allowable Gross Load (Kips)*
50,000	127
15,000	137
5,000	153
500	+

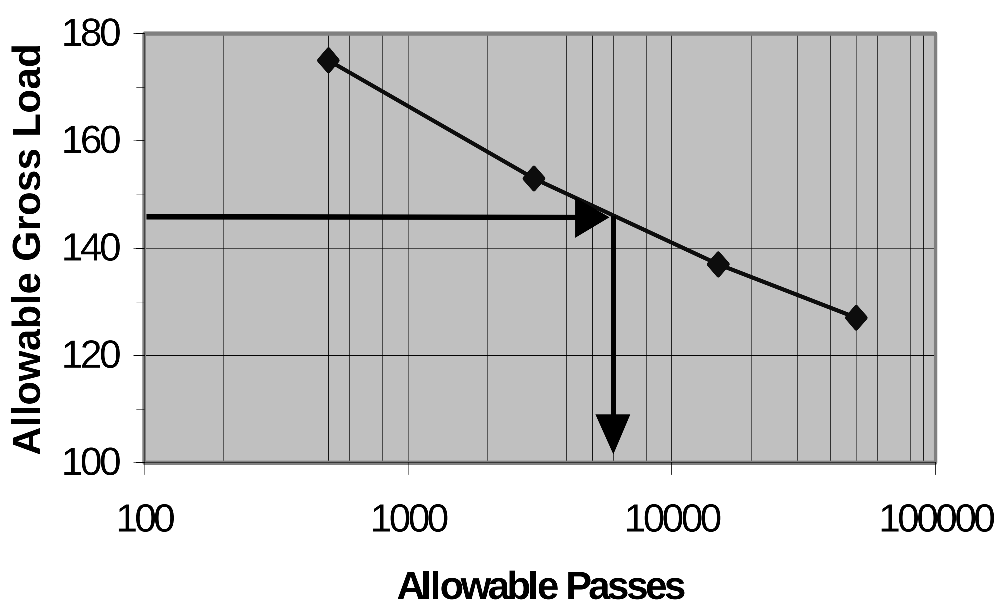

Figure 27--Keesler AFB Feature R07C Predicted C-130 Passes at 145 Kips

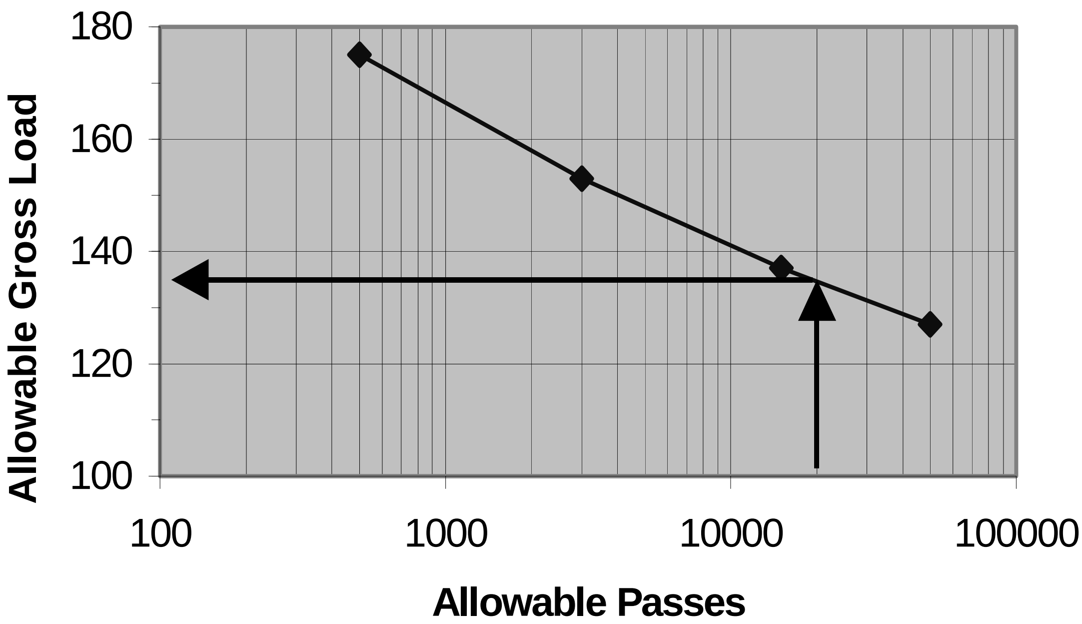

Figure 28--Keesler AFB Feature R07C C-130 AGL for 20,000 Passes

(Note: For some features, the AGL table shows an "A," indicating that the pavement cannot support the minimum weight of any aircraft in that aircraft group. Similarly, a "+" indicates the pavement can support more than the maximum weight of any aircraft in that group at that pass intensity level. Look in the Related Data Table in Appendix G to find the minimum and maximum weight of any aircraft group. If applicable, the maximum and minimum numbers should be plotted on the graph to solve this problem.)

(a) Enter the completed graph, shown as Figure 27, at the operating weight of 145 kips to determine that the pavement can safely support about 6,000 C-130 passes before failure. It is important to realize that this is a gross number that does not take into account for other using aircraft or past traffic. If accurate traffic history is not available, PCI can be use to gauge how much pavement life has been consumed. Depending on the traffic mix and PCI, adjustments should be considered.

(b) To solve the second part of the problem, enter the graph from the horizontal axis as shown in Figure 28. The aircraft weight must be limited to just about135 kips if 20,000 passes must be supported over the expected life of the pavement. Again, this is a gross number and adjustment should be considered.

Pavement Classification Number Method

The International Civil Aviation Organization (ICAO) adopted a standard method of reporting pavement strength. This method is the Aircraft Classification Number/Pavement Classification Number (ACN/PCN) method (FAA, 1983), (ICAO, 1983). The ACN is a number that expresses the demand an aircraft places on a pavement. The PCN is a number that expresses the capability of a pavement to support aircraft. Appendix E provides PCN values for each Keesler AFB pavement feature. These PCNs are based on a C-17 aircraft at Pass

Intensity Level I (50,000 passes). Just as for AGLs, the PCNs must be based on a specific aircraft group and pass intensity level. The PCN will vary depending on which aircraft group and pass level it is based upon; however the PCNs listed should be sufficient as a guide.

In the ACN/PCN method, the PCN, pavement type, subgrade strength category, tire pressure category, and evaluation method are all reported together. A code system has been implemented to allow an abbreviated presentation of the necessary information. The pavement type is abbreviated "R" for rigid (PCC) and "F" for flexible (AC) pavements. There are four subgrade categories: A, B, C, and D, for high, medium, low, and ultralow subgrade strengths, respectively. The four tire pressure categories are W, X, Y, and Z, for high, medium, low and very low tire pressures. The evaluation methods are "T" for a technical evaluation, and "U" for an evaluation that is based on the type and weight of aircraft that commonly use the airfield. The PCN code 31/R/C/W/T, for example, indicates a PCN number of 31, a rigid pavement, a low strength subgrade, high pressure tires are allowed, and a technical evaluation was performed to determine the PCN rating. Each part of the code is important. The number "31" cannot be used properly without the letters that follow.

An ACN can be obtained from Federal Aviation Administration Advisory Circular 150/5335 (FAA, 1983), AFCESA's Aircraft Characteristics for Airfield Pavement Design and Evaluation (AFCESA, 1988), or from Appendix F for any combination of pavement type, subgrade category, and aircraft weight. For a 580,000 pound C-17, the eight possible ACN values are listed below:

Table 3--All Possible ACNs for C-17 Operating at 580 kips

Rigid Pavement	Flexible Pavement
49/R/A	51/F/A
49/R/B	58/F/B
49/R/C	69/F/C
65/R/D	90/F/D

It is very important to be aware that the ACN number varies depending on aircraft weight, pavement type, and subgrade category. As shown above, for a 580,000 pound C-17, the ACN for rigid pavements varies from 49 for a high strength subgrade to 65 for an ultralow strength subgrade. For a C-17 at the same weight on a flexible pavement, the ACN ranges from 51 to 90 depending on the subgrade strength category. For lower aircraft weights, the ACNs are lower. When analyzing the effect of an aircraft on a specific pavement feature, the appropriate ACN must be selected. For example, from page E-1, the PCN for Feature R07A is 27/F/B/W/T. To determine the effect of a 580,000 pound C-17 on Feature R05A, the correct ACN to compare with the PCN is an ACN 58/F/A. More details on the PCN nomenclature are provided on page E-2.

A pavement will support operations of an aircraft if the PCN is equal to or greater than the ACN. If the PCN is less than the ACN, the pavement will be overloaded. There may be situations when operators decide it is acceptable to overload a pavement. Examples are emergency landings, short-term contingencies, exercises, and air shows. Pavements can usually support some overload, however, pavement life is reduced. The following general guidelines in Table 4 are to be used to determine the extent of operations in an overload condition on Air Force pavements.

Table 4--Air Force Recommendations for ACN/PCN Ratios

ACN/PCN Ratio	Recommendation
< 1.0	Unlimited Passes
1.0 - 1.25	Continue Operations, but Watch for Distresses
1.25 - 1.5	Limited to 10 Passes
> 1.5	Emergencies Only

The PCNs tabulated in Appendix E are for 50,000 passes of a C-17 at 580 kips, which is the Air Force standard for PCNs published in NIMA references.

An overall runway PCN is normally published in flight references to inform aircraft of a runway's load-bearing capability. This PCN based on the most restrictive primary runway pavement and is determined by selecting the weakest load capacity from the runway features considered essential to the operation of the airfield (AFJMAN 32-1121, Volume 1). See the PCN table at Appendix E for the PCN's of all the runway features. The following features were **not** included in the determination of the weakest:

Table 5—Features NOT Used to Determine Runway PCN

Runway 03/21			
Feature	**PCN**	**Feature**	**PCN**
R02C	17/F/B/W/T	R12C	42/F/B/W/T

Based on this data, the weakest feature on Runway 03/21 is R07C with a PCN of 27/F/B/W/T.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Structural Capacity: Several secondary feartures are extremely weak: Features A03B, A22C, A24C, T03C, T10C, R02C, and R11C. The runway features never seldom receive aircraft traffic and are not a notable concern. Two primary features are notably or marginally weak, Features T07A and R07C. The standard PCN published in NIMA references for U S Air Force airfields are based on the most restrictive primary runway feature and C-17 aircraft at 50,000 passes. For Keesler AFB Runway 03/21 the PCN is 27/F/B/W/T.

2. Surface Condition: Figure 29 shows a summary of the pavement surface condition of 3.6 million square feet of airfield pavements at Keesler AFB. A large amount of GOOD or worse AC Features are degraded to a point such that repairs are recommended. A smaller amount of PCC Features are in GOOD or worse condition and are similarly degraded to such a point that repairs are either recommended for near term execution or repairs are recommend to be programmed for the future.

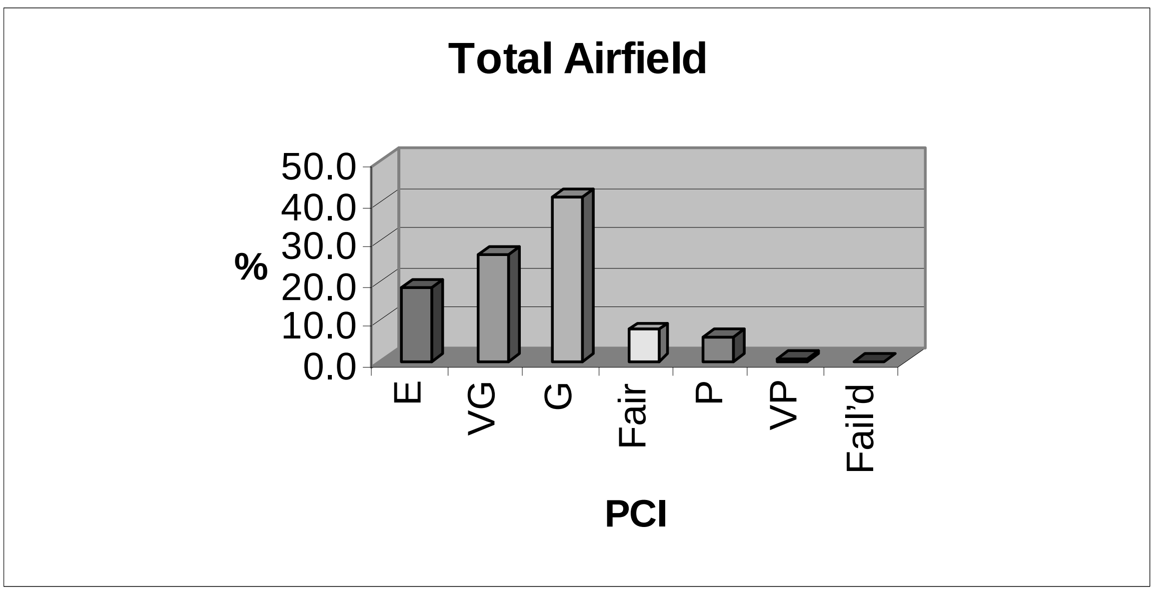

Figure 29--PCI Summary

Recommendations

Runway System

1. **Runway PCC Pavement:** All PCC runway pavement is in similar condition due to the same type of distresses. These distresses are associated with spalling, either in the form of spalls themselves or in the form of distressed patches from past repairs. Execute repairs by properly patching the spalled areas and by properly replacing the failing patches. One transverse joint on the south overrun has opened up and needs to be re-sealed; this joint should be monitored and a more extensive repair should be executed if the joint opening becomes excessive.

2. **Runway AC Pavement:** All AC runway pavement is in same condition and has the same type of distresses. The most robust repair would involve milling and replacing the top 4 inches with an overlay. This overlay approach can be expected to provide 20 years of service if not overloaded. A less robust approach would be to seal the existing cracks to prevent accelerated deterioration associated with water infiltration; at least 5 years of service could be reasonably expected, especially in areas not directly exposed to aircraft wheel loads. An optimized approach should be considered; mill and overlay the 75 foot keel of the interior and seal the cracks outside the interior keel and outside the overrun keel. Feature R07C is the weakest feature and notably weaker than the rest of the runway. Current strength is inadequate for current mission; this feature should be reconstructed to greater strength.

3. **Runway Storm Drain Depression:** In conjunction with the AC pavement reconstruction, material above and around the crossing large storm drain should be excavated and re-compacted. Measures should be taken to prevent reoccurrence of subsidence such as resealing culvert joints and placing material less susceptible to erosion or migration.

Taxiway System

4. **Taxiway "Alpha" AC & AC over PCC Features (T05A, T07A, and T08A):** Block cracks and reflected cracks are through the full depth of the AC layer. Mill full depth of AC and replace. For areas with alligator cracking or depressions reconstruct the base material. The depression associated with the storm drain crossing should be excavated full depth to the storm drain; when reconstructed, measures should be taken to prevent reoccurrence. Feature T07A is notably weak with respect to current mission; reconstruct to greater strength.

5. **Taxiway "Charlie" (T03C):** Block Cracks have propagated full depth. Alligator cracking and depressions indicate failure of base material. Feature strength is inadequate for current mission. Mill and overlay full depth of AC and reconstruct base material to greater strength.

6. **Taxiway "Alpha" South (T01A):** Within the north region of this feature, on the parallel taxiway south of Taxiway "Charlie" there is a high percentage of longitudinally cracked slabs in the trafficked keel. Route and seal low severity cracks to prevent accelerated deterioration. Patch isolated points of higher distress and replace random slabs as condition requires. Anticipate deterioration to advance with time and traffic; keel replacement may be necessary 5 to 10 years in the future. Cracks through slabs extend down through stabilized base under slab; base must be removed and reconstructed or replaced with unstabilized base in conjunction with any random slab replacement or keel replacement.

Parking Aprons

7. **AC Pavement Apron Features:** All AC pavement apron features are deteriorated to a state that require mill and overlays. This includes both features that are PCC overlaid with AC

and features of conventional AC construction. Isolated areas of alligator cracking and depressions require base reconstruction prior to placement of new AC. Prioritize, program, and executed projects based on use. The AC pavement of the Overflow Apron extremely is weak and if reconstructed must be reconstructed to greater strength.

8. **Apron Feature A27B:** This pavement was separated from A18B as a unique feature due to concentrated distress. The pavement consists of original 25' by 12.5' WW II slabs overlaid with 12.5' by 12.5' slabs in the mid 1970's. Mid-slab cracks in the underlying slabs have reflected up through the top slab to form cracks and spalls near joints. Traffic has further deteriorated these cracks; shattered slabs are common. Execute project to reconstruct full depth.

9. **Apron Feature A07A:** This feature consists of original 25' by 12.5' WW II slabs overlaid with 12.5' by 12.5' slabs in the mid 1970's. Mid-slab cracks in the underlying slabs have reflected up through the top slab to form cracks and spalls near joints. Traffic has further deteriorated these cracks. Execute isolated patching and random slab replacement in the near term. Program Fiscal Year 2006 project to reconstruct full depth.

10. **PCC Apron Pavement of Original WW II Construction:** These pavements are still serviceable due to past slab replacement projects. Features A22C and A24C are features of higher distress; these feature are also weak but probably adequate for current light use. Execute project to patch spall, replace joint sealant, and replace random slabs with multiple cracks. These pavements receive limited use by only towed aircraft; target the more extensive repairs to trafficked areas.

Replacement of Joint Sealant

11. **Joint Sealant Distress:** Joint sealant distress is a common and widespread distress. Those areas identified with HIGH and/or MEDIUM distress level should be resealed as soon as practical.

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GLOSSARY

Allowable Gross Load (AGL): The maximum aircraft load that can be supported by a pavement feature for a particular number of passes.

Allowable Passes*:* The number of passes of an aircraft operating at a specific weight that the pavement will support before failure.

Base or Subbase Courses*:* Natural or processed materials placed on the subgrade beneath the pavement.

Compacted Subgrade*:* The upper part of the subgrade, which is compacted to a density greater than the portion of the subgrade below.

Feature*:* A unique portion of the airfield pavement distinguished by traffic area, pavement type, pavement surface thickness and strength, soil layer thickness and strength, construction period, and surface condition.

Flexural Strength: For portland cement concrete, the breaking strength of a simply supported beam that is subjected to vertical loading. Also known as the Modulus of Rupture, it approximates the tensile strength of the concrete.

Modulus of Elasticity (Young's Modulus): The relationship between the applied stress and the resulting strain behavior of a material when the resulting deformations are only elastic. E = Stress/Strain.

Pass Intensity Level*:* Specific repetitions of aircraft over a pavement feature, regardless of time, that are dependent on aircraft design category.

Pass*:* The movement of an aircraft over a specific spot or location on a pavement feature.

Pavement Condition Index (PCI)*:* A numerical indicator between 0 and 100 that reflects the surface operational condition of the pavement (AFJM 32-1038).

Subgrade*:* The natural in-place soil upon which a pavement, base, or subbase course is constructed.

Type A Traffic Areas*:* Type A traffic areas are those pavement facilities that receive channelized traffic and full design weight of the aircraft (AFMAN 32-8008).

Type B Traffic Areas*:* Type B traffic areas are considered to be those areas where traffic is nearly uniform over the full width of the pavement facility, but receives the full design weight of the aircraft (AFMAN 32-8008).

Type C Traffic Areas*:* Type C traffic areas are considered to be those which the volume of traffic is low or applied weight of the operating aircraft is less than the design weight (AFMAN 32-8008).

CONVERSION FACTORS

BRITISH TO INTERNATIONAL SYSTEM (SI) UNITS

TO CONVERT	TO	MULTIPLY BY
LENGTH		
inch (in)	millimeter (mm)	25.4
inch (in)	meter (m)	.0254
foot (ft)	meter (m)	.305
yard (yd)	meter (m)	.915
mile (mi)	kilometer (km)	1.609
AREA		
square inch (in^2)	square millimeter (mm^2)	645.2
square inch (in^2)	square meter (m^2)	.0006452
square foot (ft^2)	square meter (m^2)	.093
square yard (yd^2)	square meter (m^2)	.8361
square mile (mi^2)	square kilometer (km^2)	2.59
acres	square kilometer (km^2)	.004046
VOLUME		
cubic inch (in^3)	cubic millimeter (mm^3)	16487
cubic foot (ft^3)	cubic meter (m^3)	.028
cubic yard (yd^3)	cubic meter (m^3)	.7646
MASS		
pound (lb)	kilogram (kg)	.454
FORCE		
pound (lbf)	Newton (N)	4.448
STRESS		
pound per square inch (psi)	kiloPascal (kPa)	6.895

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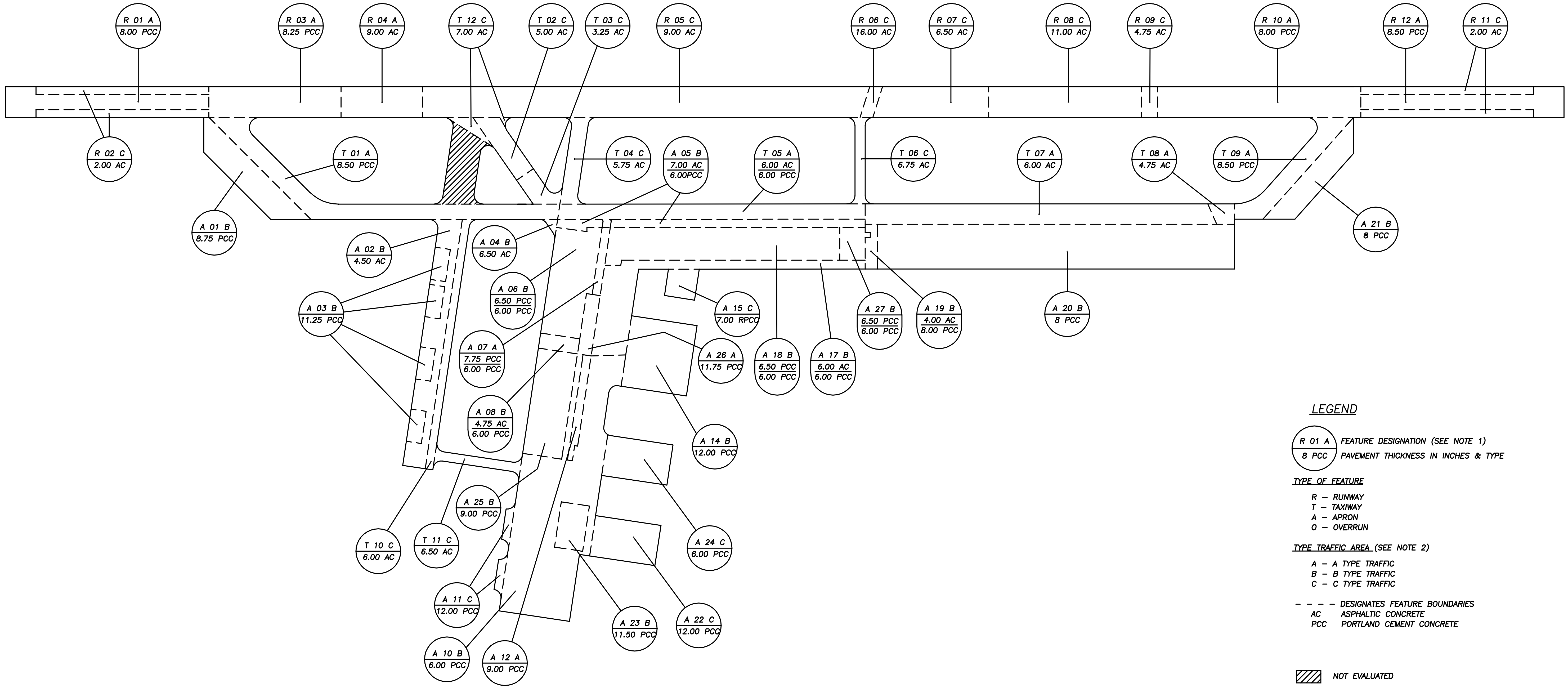


LEGEND

R 01 A — FEATURE DESIGNATION (SEE NOTE 1)
8 PCC — PAVEMENT THICKNESS IN INCHES & TYPE

TYPE OF FEATURE

- R – RUNWAY
- T – TAXIWAY
- A – APRON
- O – OVERRUN

TYPE TRAFFIC AREA (SEE NOTE 2)

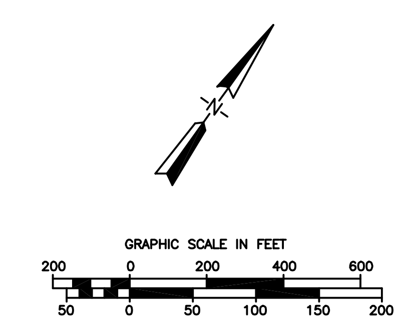
- A – A TYPE TRAFFIC
- B – B TYPE TRAFFIC
- C – C TYPE TRAFFIC

– – – – DESIGNATES FEATURE BOUNDARIES
AC ASPHALTIC CONCRETE
PCC PORTLAND CEMENT CONCRETE

(hatched) NOT EVALUATED

NOTES:

1. FEATURE DESIGNATION DENOTES TYPE OF FEATURE, NUMBER OF FEATURE FOR GIVEN FEATURE TYPE AND TYPE TRAFFIC AREA.
2. TRAFFIC AREA DESIGNATIONS ARE BASED ON AFMAN 32-8008, VOL. 1.
3. FEATURE DESIGNATIONS DO NOT CORRESPOND WITH THOSE FROM PREVIOUS REPORTS AND DRAWINGS.
4. ALL PAVEMENT THICKNESSES MEASURED TO THE NEAREST 1/4"



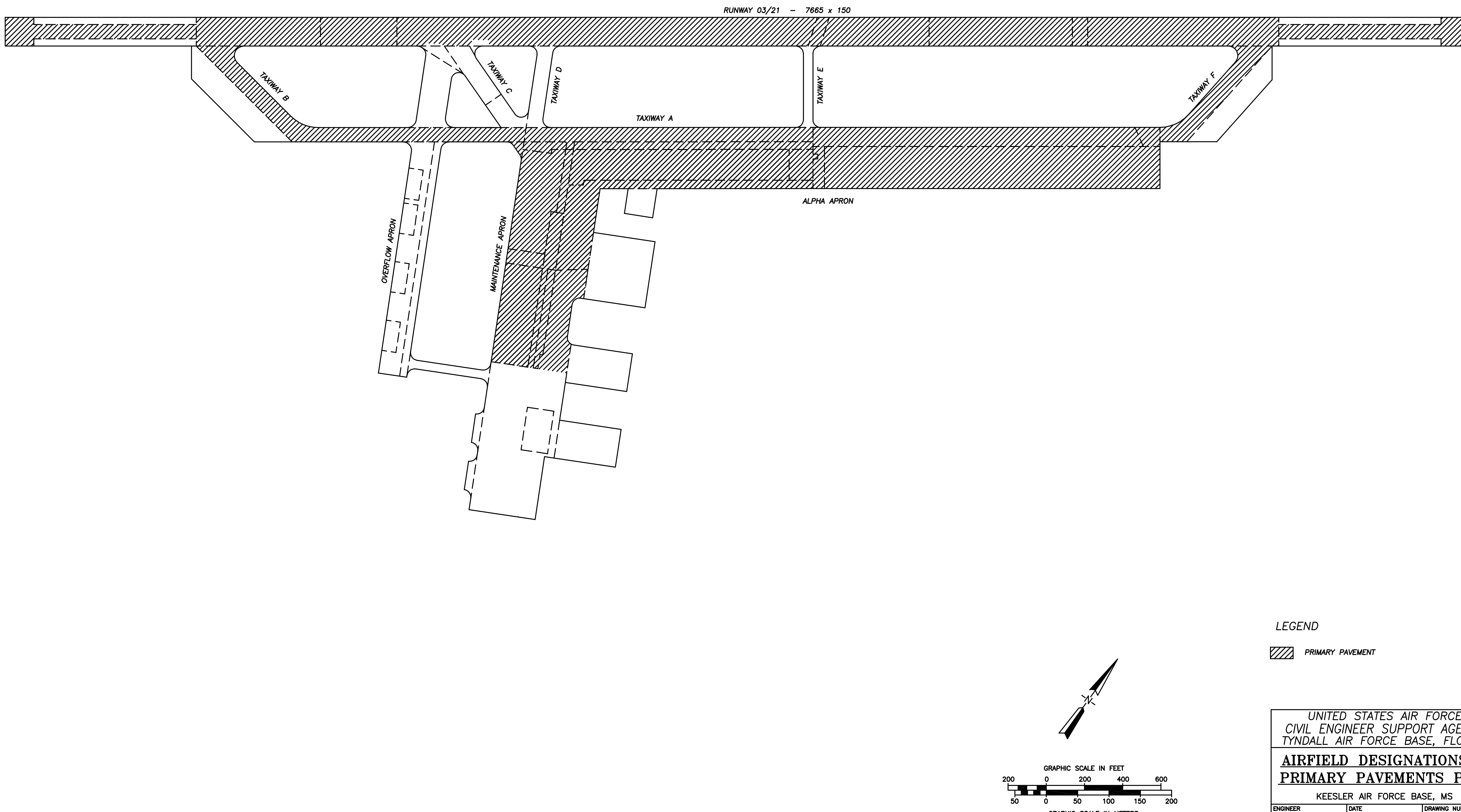
UNITED STATES AIR FORCE
CIVIL ENGINEER SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

AIRFIELD LAYOUT

KEESLER AIR FORCE BASE, MS

ENGINEER	DATE	DRAWING NUMBER
MAJ JONES	SEP 00	APPENDIX A
DRAWN: SSgt Boyd	SCALE: GRAPHIC	SHEET 1 OF 4

A–1

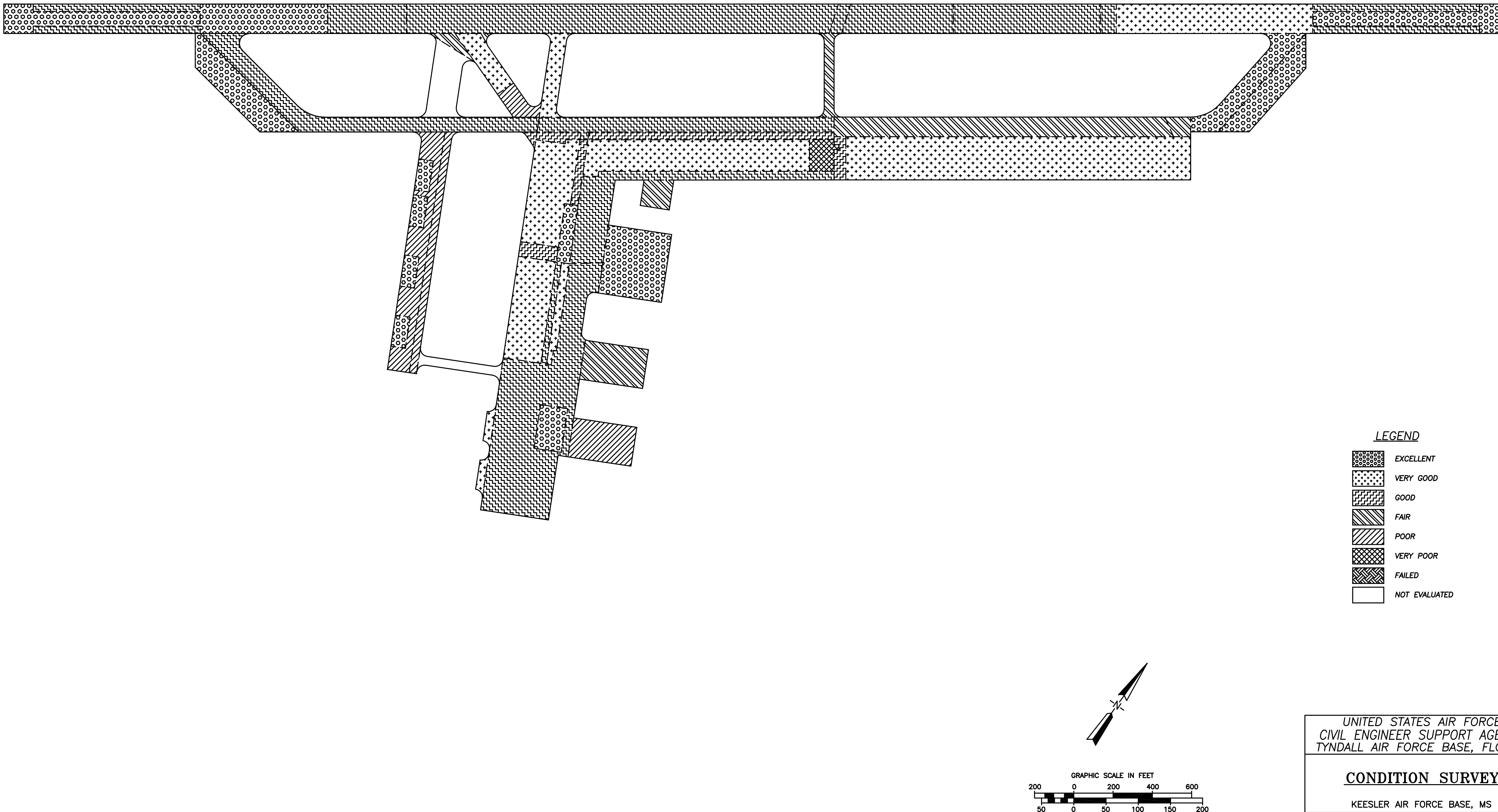


UNITED STATES AIR FORCE
CIVIL ENGINEER SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

AIRFIELD DESIGNATIONS & PRIMARY PAVEMENTS PLAN

KEESLER AIR FORCE BASE, MS

ENGINEER	DATE	DRAWING NUMBER
MAJ JONES	SEP 00	APPENDIX A
DRAWN: SSGT BOYD	SCALE: GRAPHIC	SHEET 2 OF 4

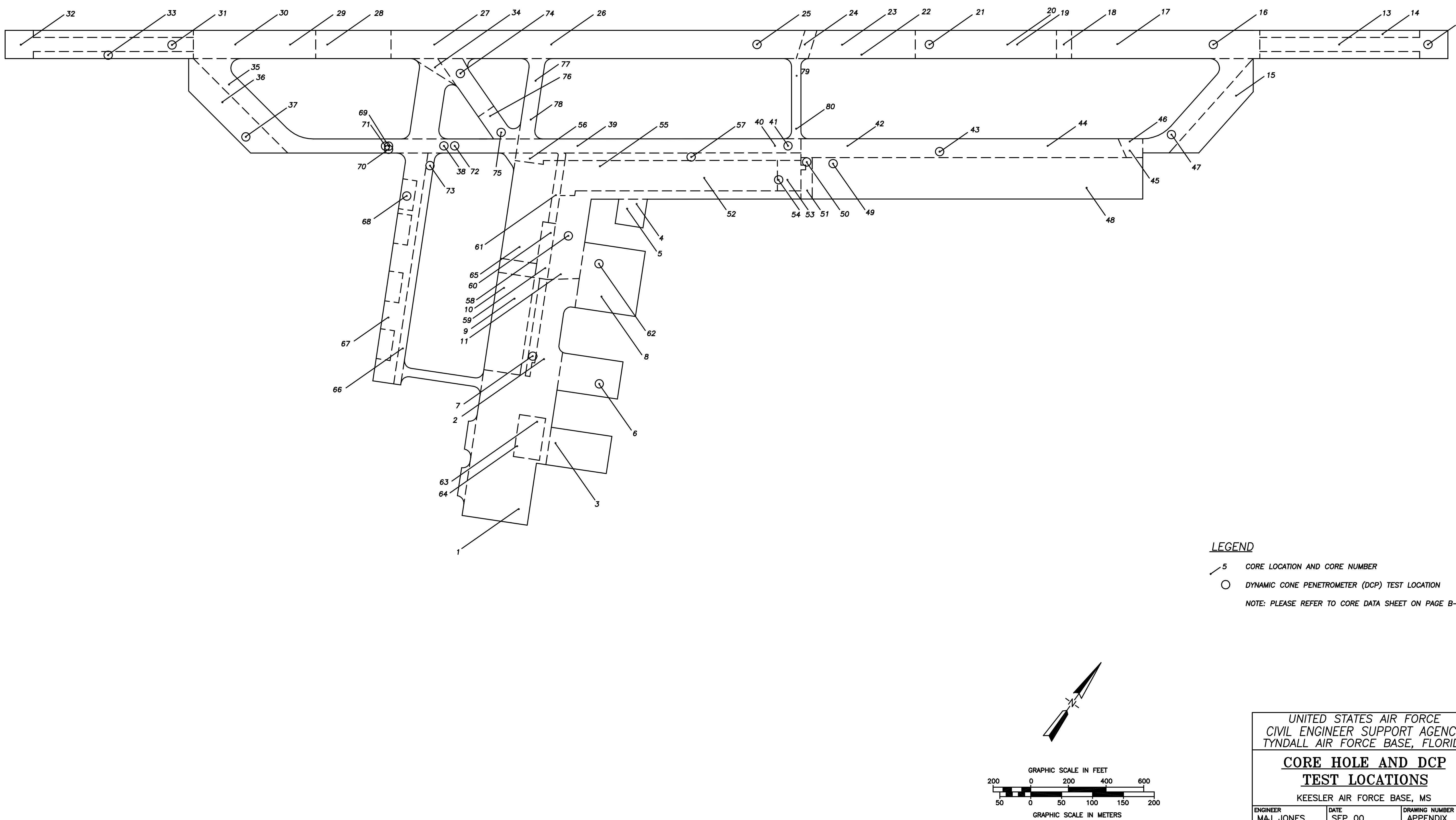


UNITED STATES AIR FORCE
CIVIL ENGINEER SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

CONDITION SURVEY

KEESLER AIR FORCE BASE, MS

ENGINEER	DATE	DRAWING NUMBER
MAJ JONES	SEP 00	APPENDIX A
DRAWN	SCALE	
SSgt Boyd	GRAPHIC	SHEET 3 OF 4



LEGEND

5 — CORE LOCATION AND CORE NUMBER

○ — DYNAMIC CONE PENETROMETER (DCP) TEST LOCATION

NOTE: PLEASE REFER TO CORE DATA SHEET ON PAGE B-1

UNITED STATES AIR FORCE
CIVIL ENGINEER SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

CORE HOLE AND DCP TEST LOCATIONS

KEESLER AIR FORCE BASE, MS

ENGINEER	DATE	DRAWING NUMBER
MAJ JONES	SEP 00	APPENDIX A
DRAWN: SSgt Boyd	SCALE: GRAPHIC	SHEET 4 OF 4

CORE LOG DATA SHEET
KEESLER AFB, MISSISSIPPI

Feature	Core	Thick (In)	Type	Flex (PSI)	Feature	Core	Thick (In)	Type	Flex (PSI)	Feature	Core	Thick (In)	Type	Flex (PSI)
A01B	36	9.00	PCC	928	A17B	58	5.50	AC	-	A27B	53	6.75	PCC	######
A01B	37	8.75	PCC	956	A17B	58	6.00	PCC	*883*	A27B	53	6.00	PCC	######
A02B	67	4.50	AC	-	A18B	52	6.00	PCC	*883*	A27B	54	6.50	PCC	865
A03B	68	11.50	PCC	900	A18B	52	6.75	PCC	787	A27B	54	5.50	PCC	765
A05B	56	7.00	AC	-	A18B	55	7.50	PCC	1001	R01A	31	7.25	PCC	1067
A05B	56	7.50	RPCC	*729*	A18B	55	8.00	RPCC	894	R01A	32	8.50	PCC	830
A05B	57	7.00	AC	-	A19B	50	4.00	AC	-	R02C	33	2.00	AC	-
A05B	57	6.25	PCC	964	A19B	50	8.50	PCC	978	R03A	29	9.00	PCC	963
A06B	65	7.25	PCC	705	A19B	51	4.00	AC	-	R03A	30	8.25	PCC	1037
A06B	65	6.00	PCC	988	A19B	51	8.00	PCC	920	R04A	28	10.75	AC	-
A07A	61	8.00	PCC	*804*	A20B	48	8.00	PCC	1034	R05C	25	8.00	AC	-
A07A	61	6.50	PCC	881	A20B	49	8.00	PCC	1013	R05C	26	9.00	AC	-
A08B	11	5.25	AC	-	A21B	15	9.00	PCC	1170	R05C	27	13.00	AC	-
A08B	11	6.00	PCC	1043	A22C	3	5.50	PCC	1116	R06C	24	17.75	AC	-
A10B	1	5.50	PCC	963	A23B	63	11.50	PCC	915	R07C	22	8.50	AC	-
A10B	2	6.00	PCC	890	A23B	64	11.50	PCC	871	R07C	23	6.50	AC	-
A12A	7	8.75	PCC	901	A24C	6	6.00	PCC	*912*	R08C	19	5.75	AC	-
A14B	8	12.50	PCC	*782*	A25B	9	9.00	PCC	*928*	R08C	20	9.25	AC	-
A14B	62	11.75	PCC	*683*	A25B	10	9.00	PCC	*883*	R08C	21	13.50	AC	-
A15C	4	8.00	RPCC	992	A26A	59	12.00	PCC	*694*	R09C	18	4.00	AC	-
A15C	5	12.00	PCC	655	A26A	60	11.50	PCC	815	R10A	16	8.50	PCC	*1091*

CORE LOG DATA SHEET
KEESLER AFB, MISSISSIPPI

Feature	Core	Thick (In)	Type	Flex (PSI)	Feature	Core	Thick (In)	Type	Flex (PSI)	Feature	Core	Thick (In)	Type	Flex (PSI)
R10A	17	8.00	PCC	*1024*	T06C	79	6.75	AC	-					
R11C	14	2.00	AC	-	T06C	80	6.50	AC	-					
R12A	12	9.00	PCC	*1034*	T07A	42	6.50	AC	-					
R12A	13	8.50	PCC	*1080*	T07A	43	6.00	AC	-					
T01A	35	8.50	PCC	*830*	T07A	44	6.50	AC	-					
T01A	38	8.00	PCC	941	T08A	45	4.50	AC	-					
T01A	69	7.50	PCC	841	T08A	46	5.00	AC	-					
T01A	70	8.50	PCC	840.17	T09A	47	8.50	PCC	1057					
T01A	71	8.50	PCC	881.48	T10C	66	5.00	AC	-					
T01A	72	9.50	PCC	914	T10C	73	5.00	AC	-					
T02C	74	5.50	AC	-	T12C	34	7.00	AC	-					
T03C	75	3.50	AC	-										
T03C	76	3.75	AC	-										
T04C	77	5.75	AC	-										
T04C	78	6.00	AC	-										
T05A	39	5.50	AC	-										
T05A	39	7.50	RPCC	924										
T05A	41	6.00	AC	-										
T05A	41	6.00	PCC	*942*										

RMP: Resin Modified Pavement PCC: Portland Cement Concrete NT: Not Tested Italic Numbers: Split Tensile test results
AC: Asphaltic Concrete TR: Tar Rubber RPCC: Reinforced Portland Cement Concrete

CURSORY PAVEMENT CONDITION SURVEY
KEESLER AFB, MISSISSIPPI

FACILITY			FLEXIBLE PAVEMENT DISTRESSES																RIGID PAVEMENT DISTRESSES														
FEAT	IDENT	COND	Alligator Cracking	Bleeding	Block Cracking	Corrugation	Depression	Jet Blast	Joint Reflection	L/T Cracking	Oil Spillage	Patching	Polished Aggregate	Raveling/Weathering	Rutting	Shoving	Slippage	Swelling	Blow-Up	Corner Break	L/T Cracking	Durability Cracking	Joint Seal Damage	Small Patch	Large Patch	Popouts	Pumping	Scaling	Settlement	Shattered Slab	Shrinkage	Joint Spalling	Corner Spalling
A01B	South Warum-up Apron	Excellent																						L H									L M
A02B	Overflow Apron	Poor	M		L M H					L M		L		L																			
A03B	Overflow Apron	Excellent																															
A04B	Maintenance Apron	Good			L		L			L				L																			
A05B	"Alpha" Apron South	Good			L		L		L M					L																			
A06B	Maintenance Apron	Very Good																			L											L	L M
A07A	Maintenance Apron Taxi-lane	Good																		L	L M H										L M H	L M	
A08B	Maintenance Apron	Good			L				L					L																			
A10B	Maintenance Apron	Good																		L	L M		H	L M	L				H	L M		L	L M
A11C	Hangar Access Apron	Very Good																			L												
A12A	Maintenance Apron Taxi-lane	Very Good																		L	L M		H	L M	L			L					L
A14B	Hangar Apron	Excellent																		L	L				L	L					X		L
A15C	Aircraft Wash Rack	Fair																		L	L M		M	L	L			L		L M	X		
A17B	"Alpha" Apron South	Good			L				L M					L																			

CURSORY PAVEMENT CONDITION SURVEY
KEESLER AFB, MISSISSIPPI

FACILITY			FLEXIBLE PAVEMENT DISTRESSES																RIGID PAVEMENT DISTRESSES														
FEAT	IDENT	COND	Alligator Cracking	Bleeding	Block Cracking	Corrugation	Depression	Jet Blast	Joint Reflection	L/T Cracking	Oil Spillage	Patching	Polished Aggregate	Raveling/Weathering	Rutting	Shoving	Slippage	Swelling	Blow-Up	Corner Break	L/T Cracking	Durability Cracking	Joint Seal Damage	Small Patch	Large Patch	Popouts	Pumping	Scaling	Settlement	Shattered Slab	Shrinkage	Joint Spalling	Corner Spalling
A18B	"Alpha" Apron South	Very Good																			L M											L M	
A19B	"Alpha" Apron North	Good			L				L M H					L																			
A20B	"Alpha" Apron North	Very Good																		L	L M		L	L	L				L	L M		L M	L
A21B	North Warm-up Apron	Excellent																						L	L							L	L
A22C	HangarApron	Poor																			L M		H	L M H						L M H			L M
A23B	Maintenance Apron	Excellent																															
A24C	Hangar Apron	Fair																		L	L M		H	L	L					L M			L
A25B	Maintenance Apron	Very Good																			L		L M			L M						L M	L M
A26A	Maintenance Apron Taxi-lane	Excellent																															
A27B	"Alpha" Apron South - Spot 12	Very Poor																		L	L M H									L M H		L M	L
R01A	Runway 03/21 Overrun; 0+00 TO -10+00	Excellent																						L								L	L M
R02C	Runway 03/21 Overrun; 0+00 TO -8+50	Good			L					L		L		L																			
R03A	Runway 03/21; 0+00 TO 5+00	Excellent																						L								L M	L M
R04A	Runway 03/21; 6+00 TO 10+00	Good			L					L M				L																			

CURSORY PAVEMENT CONDITION SURVEY
KEESLER AFB, MISSISSIPPI

FACILITY			FLEXIBLE PAVEMENT DISTRESSES																RIGID PAVEMENT DISTRESSES														
FEAT	IDENT	COND	Alligator Cracking	Bleeding	Block Cracking	Corrugation	Depression	Jet Blast	Joint Reflection	L/T Cracking	Oil Spillage	Patching	Polished Aggregate	Raveling/Weathering	Rutting	Shoving	Slippage	Swelling	Blow-Up	Corner Break	L/T Cracking	Durability Cracking	Joint Seal Damage	Small Patch	Large Patch	Popouts	Pumping	Scaling	Settlement	Shattered Slab	Shrinkage	Joint Spalling	Corner Spalling
R05C	Runway 03/21; 10+00 TO 32+10	Good			L					L M				L																			
R06C	Runway 03/21; 32+10 TO 32+70	Good			L					L M				L																			
R07C	Runway 03/21; 32+70 TO 38+00	Good			L		L			L M		L		L																			
R08C	Runway 03/21; 38+00 TO 45+50	Good			L		L			L M				L																			
R09C	Runway 03/21; 45+50 TO 46+30	Good			L					L M				L																			
R10A	Runway 03/21; 46+30 TO 56+30	Very Good																						L M							X	L M	L M
R11C	Runway 03/21 Overrun; 56+30 TO 64+30	Good	L		L					L M				L																			
R12A	Runway 03/21 Overrun; 56+30 TO 66+30	Excellent																			L			L M								L	L
T01A	Taxiways "Alpha" South & "Bravo"	Good																			L M H			L	L M						L		L
T02C	Taxiway "Charles"	Very Good								L				L																			
T03C	Taxiway "Charles"	Poor	M		M H		L			L M H				L M																			
T04C	Taxiway "Delta"	Very Good								L				L																			
T05B	Taxiway "Alpha" Center	Good			L		L		L M			L		L																			
T06C	Taxiway "Echo"	Fair	L		L M		L			L				L M																			

CURSORY PAVEMENT CONDITION SURVEY
KEESLER AFB, MISSISSIPPI

FACILITY			FLEXIBLE PAVEMENT DISTRESSES																RIGID PAVEMENT DISTRESSES														
FEAT	IDENT	COND	Alligator Cracking	Bleeding	Block Cracking	Corrugation	Depression	Jet Blast	Joint Reflection	L/T Cracking	Oil Spillage	Patching	Polished Aggregate	Raveling/Weathering	Rutting	Shoving	Slippage	Swelling	Blow-Up	Corner Break	L/T Cracking	Durability Cracking	Joint Seal Damage	Small Patch	Large Patch	Popouts	Pumping	Scaling	Settlement	Shattered Slab	Shrinkage	Joint Spalling	Corner Spalling
T07A	Taxiway "Alpha" North	Fair	L M		L M H		L			L M H		M		L																			
T08A	Taxiway "Alpha" North	Fair	L M		L M		L					L																					
T09A	Taxiway "Foxtrot"	Excellent																		L													L
T10C	Overflow Apron Taxiway	Poor			L M H					L M		L		L																			
T12C	Taxiway "Charles"	Fair			L M					L				M																			

L/M/H: Denotes severity level (Low, medium, High)   Y: Severity level not applicable

PHYSICAL PROPERTY DATA 2000 KEESLER AFB, MISSISSIPPI																	
				OVERLAY PAVEMENT			PAVEMENT			BASE			SUBBASE			SUBGRADE	
FEAT	IDENT	AREA sq ft	COND	THICK (in)	DESC	FLEX (psi)	THICK (in)	DESCRP	FLEX (psi)	THICK (in)	DESCRP	K/CBR	THICK (in)	DESCRP	K/CBR	DESC	K/CBR
A01B	SOUTH WARM-UP APRON	84,066	EXCEL	-	-	-	8.75	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
A02B	OVERFLOW APRON	93,546	POOR				4.50	AC	-	6.00	SAND-SHELL	55	-	-	-	FINE SAND (SP)	40
A03B	OVERFLOW APRON	48,000	EXCEL	-	-	-	11.25	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	40
A04B	"ALPHA" APRON SOUTH	4,249	GOOD	-	-	-	6.50	AC	-	6.00	SAND-SHELL	80	-	-	-	SILTY-SAND (SP-SM)	40
A05B	"ALPHA" APRON SOUTH	60,492	GOOD	7.00	AC	-	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A06B	MAINTENANCE APRON	112,615	VERY GOOD	6.50	PCC	800	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A07A	MAINTENANCE APRON TAXI-LANE	13,448	GOOD	7.75	PCC	800	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A08B	MAINTENANCE APRON	14,577	GOOD	4.75	AC	-	6.00	PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A10B	MAINTENANCE APRON	354,235	GOOD	-	-	-	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	FINE SAND (SP)	250
A11C	HANGAR ACCESS APRON	15,200	VERY GOOD	-	-	-	12.00	PCC	725	-	-	-	-	-	-	FINE SAND (SP)	250
A12A	MAINTENANCE APRON TAXI-LANE	19,802	VERY GOOD	-	-	-	9.00	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	250
A14B	HANGAR APRON	116,375	EXCEL	-	-	-	12.00	PCC	700	-	-	-	-	-	-	SILTY-SAND (SP-SM)	270
A15C	AIRCRAFT WASHRACK	21,440	FAIR	-	-	-	7.00	RPCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A17B	ALPHA APRON SOUTH	125,510	GOOD	6.00	AC	-	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A18B	ALPHA APRON SOUTH	185,365	VERY GOOD	6.50	PCC	800	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
A19B	ALPHA APRON NORTH	12,600	GOOD	4.00	AC	-	8.00	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	250

PHYSICAL PROPERTY DATA 2000 KEESLER AFB, MISSISSIPPI																		
				OVERLAY PAVEMENT			PAVEMENT			BASE			SUBBASE			SUBGRADE		
FEAT	IDENT	AREA sq ft	COND	THICK (in)	DESC	FLEX (psi)	THICK (in)	DESCRP	FLEX (psi)	THICK (in)	DESCRP	K/CBR	THICK (in)	DESCRP	K/CBR	DESC	K/CBR
A20 B	ALPHA APRON NORTH	386,725	VERY GOOD	-	-	-	8.00	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	250
A21B	NORTH WARMUP APRON	64,933	EXCEL	-	-	-	8.00	PCC	799	5.00	CEMENT STAB SAND-SHELL	499	-	-	-	FINE SAND (SP)	-
A22C	HANGAR APRON	65,000	POOR	-	-	-	5.50	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	-
A23B	MAINTENANCE APRON	31,500	EXCEL	-	-	-	11.50	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	-
A24C	HANGAR APRON	65,022	FAIR	-	-	-	6.00	PCC	800	-	-	-	-	-	-	FINE SAND (SP)	-
A25B	MAINTENANCE APRON	101,677	VERY GOOD	-	-	-	9.00	PCC	800	7.00	SAND-SHELL	-	-	-	-	FINE SAND (SP)	-
A26A	MAINTENANCE APRON TAXI-LANE	20,400	EXCEL	-	-	-	11.75	PCC	750	-	-	-	-	-	-	FINE SAND (SP)	-
A27B	ALPHA APRON SOUTH - SPOT 12	20,157	VERY POOR	6.50	PCC	800	6.00	PCC	800	2.00	FINE SAND (SP)	-	-	-	-	SILTY-SAND (SP-SM)	-
R01A	Runway 03/21 Overrun; 0+00 TO -10+00	86,250	EXCEL	-	-	-	8.00	PCC	800	7.50	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
R02C	Runway 03/21 Overrun; 0+00 TO -8+50	63,750	GOOD	-	-	-	2.00	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40
R03A	Runway 03/21; 0+00 TO 5+00	97,500	EXCEL	-	-	-	8.25	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
R04A	Runway 03/21; 6+00 TO 10+00	60,000	GOOD	-	-	-	9.00	AC	-	6.00	SAND-SHELL	60	-	-	-	FINE SAND (SP)	-
R05C	Runway 03/21; 10+00 TO 32+10	326,430	GOOD	-	-	-	9.00	AC	-	6.00	SAND-SHELL	60	-	-	-	SILTY-SAND (SP-SM)	40
R06C	Runway 03/21; 32+10 TO 32+70	9,444	GOOD	-	-	-	16.00	AC	-	13.00	SAND-SHELL	-	-	-	-	FINE SAND (SP)	30
R07C	Runway 03/21; 32+70 TO 38+00	81,724	GOOD	-	-	-	6.60	AC	-	6.00	SAND-SHELL	60	-	-	-	SILTY-SAND (SP-SM)	40
R08C	Runway 03/21; 38+00 TO 45+50	112,500	GOOD	-	-	-	9.00	AC	-	6.00	SAND-SHELL	60	-	-	-	FINE SAND (SP)	-
R09C	Runway 03/21; 45+50 TO 46+30	12,000	GOOD	-	-	-	4.75	AC	-	11.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	30

PHYSICAL PROPERTY DATA 2000
KEESLER AFB, MISSISSIPPI

				OVERLAY PAVEMENT			PAVEMENT			BASE			SUBBASE			SUBGRADE	
FEAT	IDENT	AREA sq ft	COND	THICK (in)	DESC	FLEX (psi)	THICK (in)	DESCRP	FLEX (psi)	THICK (in)	DESCRP	K/CBR	THICK (in)	DESCRP	K/CBR	DESC	K/CBR
R10A	Runway 03/21; 46+30 TO 56+30	150,000	VERY GOOD	-	-	-	8.00	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
R11C	NE-SW RUNWAY EDGES STA 56+30 TO 64+30	63,750	GOOD	-	-	-	2.00	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40
R12A	NE-SW RUNWAY OVERRUN KEEL AND TURNAROUND S STA 56+30	86,250	EXCEL	-	-	-	8.50	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
T01A	Taxiways "Alpha" South & "Bravo"	153,841	GOOD	-	-	-	8.50	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
T02C	Taxiway "Charlie"	35,370	VERY GOOD	-	-	-	5.00	AC	-	6.00	SAND-SHELL	80	-	-	-	SILTY-SAND (SP-SM)	40
T03C	Taxiway "Charlie"	20,270	POOR	-	-	-	3.25	AC	-	6.00	SAND-SHELL	80	-	-	-	SILTY-SAND (SP-SM)	40
T04C	Taxiway "Delta"	18,105	VERY GOOD	-	-	-	5.75	AC	-	7.00	SAND-SHELL	80	-	-	-	SILTY-SAND (SP-SM)	40
T05A	Taxiway "Alpha" Center	113,002	GOOD	6.00	AC	-	6.00	8-6-6-8 PCC	800	-	-	-	-	-	-	SILTY-SAND (SP-SM)	160
T06C	Taxiway "Echo"	24,489	FAIR	-	-	-	6.75	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40
T07A	Taxiway "Alpha" North	170,343	FAIR	-	-	-	6.00	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40
T08A	Taxiway "Alpha" North	10,889	FAIR	-	-	-	4.75	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40
T09A	Taxiway "Foxtrot"	70,495	EXCEL	-	-	-	8.50	PCC	800	6.00	CEMENT STAB SAND-SHELL	500	-	-	-	FINE SAND (SP)	-
T10C	Overflow Apron Taxiway	47,980	POOR	-	-	-	5.00	AC	-	6.00	SAND-SHELL	55	-	-	-	FINE SAND (SP)	40
T12C	Taxiway "Charles"	11,842	FAIR	-	-	-	7.00	AC	-	6.00	SAND-SHELL	50	-	-	-	FINE SAND (SP)	40

NOTES:
1. **Full depth of base course could not be penetrated by the DCP rod in some areas due to refusal.**
2. **Soil classification were taken from 1976 and 1988 report.**
3. **An percent sign (%) indicates information based on field soil classification, similar construction or construction period.**
4. **A soil classification with no notation indicates laboratory soil classification in 1988**
5. **All length and width dimensions are approximate.**
6. **Condition codes were determined using modified PCI methods described in the narrative.**
7. **Flexural strengths for PCC pavements were determined using Free-Free Resonant Column methods on core samples taken from in-situ concrete.**
8. **All laboratory soil classifications conform to ASTM standards.**
9. **PCC - denotes Portland Cement Concrete.**
10. **RPCC - denotes reinforced Portland Cement Concrete**
11. **AC - denotes Asphaltic Concrete.**

LAYERED ELASTIC MODEL DATA
KEESLER AFB, MISSISSIPPI

FEATURE	LAYER 1 THICKNESS (in)	TYPE	E MODULUS	FLEXURAL STRENGTH (psi)	LAYER 2 THICKNESS (in)	TYPE	E MODULUS	FLEXURAL STRENGTH (psi)	LAYER 3 THICKNESS (in)	TYPE	E MODULUS
A01B	13.00	PCC	5,000,000	800	-	-	-	-	227.0	SG	18,794
A02B	7.00	AC	191,654	-	-	-	-	-	233.0	SG	11,453
A03B	13	PCC	4,842,630	800	-	-	-	-	227.5	SG	19,608
A04B	6.50	AC	119,542	-	6.00	UN	118,160	-	227.5	SG	11,324
A05B	7.00	AC	460,770	-	8.00	HQ	5,758,064	-	226.0	SG	12,279
A06B	14.00	PCC	5,000,000	800	-	-	-	-	226.0	SG	13967
A07A	14	PCC	3,523,475	800	-	-	-	-	226.0	SG	18,622
A08B	5	AC	498,284	-	8.00	HQ	4,619,106	-	227.3	SG	16,764
A10B	8.00	PCC	3624595	800	-	-	-	-	232.0	SG	15,560
A11C	NOT EVALUATED				-	-	-	-	-	-	-
A12A	9.00	PCC	5,000,000	800	-	-	-	-	231.0	SG	11,518
A14B	12.00	PCC	4,493,216	800	-	-	-	-	228.0	SG	18,900
A15C	8.00	PCC	5,000,000	800	-	-	-	-	232.0	SG	16,030
A17B	6.00	AC	566,353	-	6.00	PCC	5,000,000	800	228.0	SG	16,475
A18B	11.00	PCC	5,000,000	800	-	-	-	-	229.0	SG	18,976
A19B	4.00	AC	428,731	-	8.00	PCC	1,648,311	800	228.0	SG	19,358
A20 B	8.00	PCC	5,000,000	800	-	-	-	-	232.0	SG	15,891
A21B	12.00	PCC	5,000,000	800	-	-	-	-	228.0	SG	23,462
A22C	5.50	PCC	5,000,000	800	-	-	-	-	234.5	SG	9,519
A23B	12.00	PCC	4,116,396	800	-	-	-	-	228.0	SG	11,988
A24C	6.00	PCC	4,862,874	800	-	-	-	-	234.0	SG	14,058
A25B	9.50	PCC	5,000,000	800	-	-	-	-	230.5	SG	14,310
A26A	11.75	PCC	5,000,000	800	-	-	-	-	228.3	SG	14,042
A27B	12.00	PCC	1765813	800	-	-	-	-	228.0	SG	14,951
R01A	8.00	PCC	5,000,000	800	7.50	HQ	743,510	-	224.5	SG	16,397
R02C	3.00	AC	512,129	-	-	-	-	-	237.0	SG	19,393
R03A	12.00	PCC	5,000,000	800	-	-	-	-	228.0	SG	18,186
R04A	9.00	AC	531,150	-	-	-	-	-	231.0	SG	13,724
R05C	10.50	AC	147,380	-	-	-	-	-	229.5	SG	19,054
R06C	16.00	AC	167,336	-	13.00	UN	623,843	-	211.0	SG	13,590
R07C	6.50	AC	287,433	-	-	-	-	-	233.5	SG	17,033
R08C	11.50	AC	163,816	-	-	-	-	-	228.5	SG	18,974
R09C	4.50	AC	336,538	-	10.00	UN	61,584	-	225.5	SG	23,885
R10A	12.00	PCC	4,459,427	800	-	-	-	-	228.0	SG	14,734
R11C	4.00	AC	36,975	-	-	-	-	-	236.0	SG	15,645
R12A	12.00	PCC	4,231,213	800	-	-	-	-	228.0	SG	21,430
T01A	12	PCC	5,000,000	800	-	-	-	-	228.0	SG	14,022
T02C	6	AC	466,880	-	-	-	-	-	234.0	SG	12,031

LAYERED ELASTIC MODEL DATA
KEESLER AFB, MISSISSIPPI

FEATURE	LAYER 1 THICKNESS (in)	TYPE	E MODULUS	FLEXURAL STRENGTH (psi)	LAYER 2 THICKNESS (in)	TYPE	E MODULUS	FLEXURAL STRENGTH (psi)	LAYER 3 THICKNESS (in)	TYPE	E MODULUS
T03C	4	AC	288,966	-	-	-	-	-	236.0	SG	12,485
T04C	7	AC	263,050	-	-	-	-	-	233.0	SG	16,322
T05A	12.00	AC	1,559,582	-	-	-	-	-	228.0	SG	20,275
T06C	6.75	AC	188,860	-	6.00	UN	15,070	-	227.3	SG	16,381
T07A	6.00	AC	313,141	-	7.00	UN	8,552	-	227.0	SG	12,129
T08A	6.00	AC	724,715	-	-	-	-	-	234.0	SG	20,733
T09A	10.00	PCC	5,000,000	800	-	-	-	-	230.0	SG	18,030
T10C	6.00	AC	239,765	-	-	-	-	-	234.0	SG	12,191
T12C	7.00	AC	655,830	-	-	-	-	-	233.0	SG	16,277

Layer Types: AC - Asphaltic Concrete; UN - Unstabilized Base/Subbase; HQ - High Quality Stabilized Base; PCC - Portland Cement Concrete; ST - Stabilized Base/Subbase; SG - Subgrade

NOTE: This table contains the WESDEF layered system models which were used, along with flexural strengths for PCC layers, to compute the AGL's and PCN's using WESPAVE. These models do not necessarily coincide with the actual pavement layer structure as presented in the Physical Property Data Summary, but are those where the computed deflections most closely approximated those measured in the field.

CONSTRUCTION HISTORY
KEESLER AFB, MISSISSIPPI

FEATURE	DESIGNATION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (IN)	
R01A	NE-SW RUNWAY OVERRUN KEEL AND TURNAROUND STA 0+00 TO -10+00	1973 1979 1982	8.0 PCC 8.0 PCC	US NAVY-PROJECT N62467-72-0398 SEAL PCC EDGE PAVEMENTS PROJECT 77-0032 WIDEN EXISTING PCC OVERRUN KEEL SECTIONS PROJECT KE-83-0044
R02C	NE-NW RUNWAY EDGES STA 0+00 TO -8+50	1973	2.0 AC	US NAVY -PROJECT N62467-72-C-0398
R03A	NE-SW RUNWAY STA 0+00 TO 5+00	1973 1977	8.0 PCC 8.0 PCC	RECONSTRUCTION, US NAVY -PROJECT N62467-72-C-0398
R04A	NE-SW RUNWAY STA 6+00 TO 10+00	1942 UNK 1959 1968 1976 1982 1986	2.0 AC 2.0 AC 1.5 AC 4.0 AC 3.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY OVERLAY SEAL COAT USAF OVERLAY, PROJECT KE-76-0027 ROUTE/SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGESEACH SIDE, REPLACE WITH 3" AC KE-83-0030, 86-0031
R05C	NE-SW RUNWAY STA 10+00 TO 32+10	1942 UNK 1959 1968 1976 1982 1986	2.0 AC 2.0 AC 1.5 AC 4.0 AC 3.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY OVERLAY SEAL COAT USAF OVERLAY, PROJECT KE-76-0027 ROUTE/SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGESEACH SIDE, REPLACE WITH 3" AC KE-83-0030, 86-0039, 86-0031
R06C	NE-SW RUNWAY STA 32+10 TO 32+70	1972 1976 1982 1986	12.5 AC 4.0 AC 3.0 AC	RECONSTRUCTION, BCE USAF OVERLAY, PROJECT KE-76-0027 ROUTE SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGES EACH SIDE, REPLACE WITH 3" AC KE-83-0008, 86-0030, 86-0031
R07C	NE-SW RUNWAY STA 32+70 TO 38+00	1942 UNK 1959 1968 1976 1982 1986	2.0 AC 2.0 AC 1.5 AC 4.0 AC 3.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY OVERLAY SEAL COAT USAF OVERLAY, PROJECT KE-76-0027 ROUTE/SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGESEACH SIDE, REPLACE WITH 3" AC KE-83-0030, 86-0039, 86-0031
R08C	NE-SW RUNWAY STA 38+00 TO 45+50	1942 UNK 1959 1973 1982 1986	2.0 AC 2.0 AC 1.5 AC 1.5 AC 3.0 AC	COE, ORIGINAL PROJECT OVERLAY OVERLAY OVERLAY, US NAVY-PROJECT N62467-72-C-0398 ROUTE SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGES EACH SIDE, REPLACE 3" AC KE-83-0008, 86-0030, 86-0031

CONSTRUCTION HISTORY
KEESLER AFB, MISSISSIPPI

FEATURE	DESIGNATION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (IN)	
R09C	NE-SW RUNWAY STA 45+50 TO 46+30	1973 1982 1986	4.0 AC 3.0 AC	RECONSTRUCTION, US NAVY -PROJECT N62467-72-C-0398 ROUTE/SEAL AORIN AND RUNWAY JOINTS PROJECT KE-82-0006 COLD MILL 3" AT 75' WIDE KEEL AND 1.5" AT 37.5' EDGE EACH SIDE, REPLACE 3" AC KE-83-0008, 86-0030, 86-0031
R10A	NE-SW RUNWAY STA 46_30 TO 56+30	1973	8.0 PCC	RECONSTRUCTION, US NAVY PROJECT NE62467-72-C-0398
R11C	NE-SW RUNWAY EDGES STA 56+30 TO 64+30	1973	2.0 AC	US NAVY -PROJECT N62467-72-C-0398
R12A	NE-SW RUNWAY OVERRUN KEEL AND TURNAROUNDS STA 56+30 TO 66+30	1973 1979 1982	8.0 PC 8.0 PC	US NAVY -PROJECT N62467-72-C-0398 SEAL PCC EDGE PAVEMENTS PROJECT 77-0032 WIDEN EXISTING, PCC OVERRUN KEEL SECTIONS PROJECT KE-83-0044
T01A	TAXIWAY 2	1973	8.0 PC	RECONSTRUCTION, US NAVY-PROJECT N62467-72-C-0398
T02C	TAXIWAY 3	1942 UNK 1968 1983 1986	2.0 AC 1.0 AC 4.0 AC 6.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY SEAL COAT MILL 2" EXISTING PAVEMENT/REPLACE WITH 4" AC PROJECT KE-83-0009 COLD MILL EXISTING/REPLACE WITH 6" AC KE-83-0008, 86-0030, 86-0031
T03C	TAXIWAY 3	1942 UNK 1968 1983	2.0 AC 1.0 AC 4.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY SEAL COAT MILL 2" EXISTING PAVEMENT/REPLACE WITH 4" AC PROJECT KE-83-0009
T04C	TAXIWAY 4	1953 1968 1986	2.5 AC 6.0 AC	COE, ORIGINAL CONSTRUCTION SEAL COAT COLD MILL EXISTING/REPLACE WITH 6" AC KE-83-0008, 86-0030, 86-0031
T05A	TAXIWAY 6	1942 1974 1982 UNK	6/8.0 PCC 4.0AC 2.0 AC	8/6/6/6" PCC, COE OVERLAY, US NAVY PROJECT N62467-74-C-0008 ROUTE SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0006
T06C	TAXIWAY 5	1942 UNK 1975	2.0 AC 1.5 AC 2.0 AC	COE ORIGINAL CONSRTUCTION OVERLAY OVERLAY, PROJECT 73-0036
T07A	TAXIWAY 6	1942 1953 UNK 1975 1982 1983	2.0 AC 1.0 AC 1.0 AC 2.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY AND LEVELING COURSE OVERLAY OVERLAY, PROJECT 73-0036 ROUTE SEAL APRON AND RUNWAY JOINTS PROJECT KE-82-0009 MILL 2" EXISTING PAVEMENT/REPLACE WITH 4" AC PROJECT KE-83-0009
T08A	TAXIWAY 6	1973 1983	4.5 AC	RECONSRTUCTION, US NAVY PROJECT N62467-72-C-0398 MILL 2" EXISTING PAVEMENT/REPLACE WITH 4" AC PROJECT KE-83-0009

CONSTRUCTION HISTORY
KEESLER AFB, MISSISSIPPI

FEATURE	DESIGNATION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (IN)	
T09A	TAXIWAY 6	1973	8.0 PCC	RECONSRTUCTION, US NAVY PROJECT N62467-72-C-0398
T10C	TAXIWAY 1	1942 1968 1975	2.5 AC 6.0 AC	COE, ORIGINAL CONSTRUCTION SEAL COAT OVERLAY, PROJECT KE-73-0036
T11C	TAXIWAY 1	1942 UNK 1975	2.0 AC 1.5 AC 2.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY OVERLAY, PROJECT 73-0036
A01B	SOUTH WARMUP APRON	1973	8.0 OCC	US NAVY PROJECT N62467-72-C-0398
A02B	APRON PORTION OF TAXIWAY 1	1942 1975	2.5 AC 2.0 AC	COE, ORIGINAL CONSTRUCTION OVERLAY PROJECT KE-73-0036
A03B	AIRCRAFT PARKING PADS	1981	12.0 PCC	PROJECT KE-79-0017A/B
A04B	FILET OF TAXIWAY 2 AND PARKING APRON	1973	6.5 AC	US NAVY PROJECT N62467-72-C-0398
A05B	PARKING APRON 2	1942 UNK	6/8.0 PCC 7.0 AC	8/6/6/8" PCC, COE UNKNOWN
A06B	PARKING APRON 2	1942 1962 1969 1974	6/8.0 PCC 6.0 PCC	68/6/6/8" PCC, COE 77 SLABS REPLACCES WITH 8" PCC REINFORCED WITH 6"X6"X#5 WWF-PROJECT KE-68-2 SEAL JOINTS, PDOJECT KE-96-9 OVERLAY, US NAVY PROJECT N62467-74-C-0008
A07A	TAXILANE ON APRON 2	1942 1969 1974	6/8.0 PCC 6.0 PCC	8/6/6/8" PCC, COE SEAL JOINTS, PROJECT KE-96-9 OVERLAY, US NAVY PROJECT N62467-74-C-0008
A08B	PARKING APRON 2	1942 1969 1975	6/8.0 PCC 4.25 AC	8/6/6/8" PCC, COE SEAL JOINTS, PROJECT KE-96-9 TRANSITION AREA
A09A	TAXILANE ON APRON 2	1942 1969 1975	6/8.0 PCC 4.25 AC	8/6/6/8" PCC, COE SEAL JOINTS, PROJECT KE-96-9 TRANSITION TO OLD RAMP PAVEMENT
A10B	PARKING APRON 1	1942 1962 1969 1981 1982 1986 1988*	6/8.0" PCC 6.0 PCC 9.0 PCC 9.0 PCC	8/6/6/8.0" PCC, COE 38 SLABS REPLACED WITH 8" PCC, REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2 SEAL JOINTS, PROJECT KE-96-9 REPAIR REPLACE BROKEN PCC SLABS, KE-79-0024 ROUTE SEAL APRON AND RUNWAY JOINTS PROJRCT KE-82-0006 SLAB REPLACEMENT APPROX 20% REPLACED KE-83-0008, 86-0031, 86-0031 SLAB REPLACEMENT APPROX 10% REPLACED PROJECT KE-87-0024
A11B	NOSE DOCK ACCESS APRONS	1973-1975	12.0 PCC	US NAVY PROJECTS N62467-72-C-0259 N62647-74-C-0057, N62467-75-C-0389, TAERS TO 8" ON SIDES OF NON-TRAFFIC AREAS
A12A	TAXILANE ON APRON 1	1942 1969 1977 1981	6/8.0 PCC 9.0 ACC 8.0 PCC	8/6/6/8" PCC, COE SELA JOINTS PROJECT KE-96-9 REPLACE 11 SLABS PARKING APRON PROJECT KE-77-0054 REPLACE 18 SLABS
A13A	HANGER ACCESS APRON	1973-1975	12.0 PCC	US NAVY PROJECTS N62467-72-C-0259 N62647-74-C-0057, N62467-75-C-0389, TAERS TO 8" ON SIDES OF NON-TRAFFIC AREAS

CONSTRUCTION HISTORY
KEESLER AFB, MISSISSIPPI

FEATURE	DESIGNATION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (IN)	
A14B	ADDITIONAL PARKING APRON 2	1945 1969 1977 1983	6/9.0 PCC 12.0 PCC	9/6/6/9" PCC, COE SEALED JOINTS, PROJECT KE-96-9 REMOVE AND REPLACE ASPHALT, AIRCRAFT PARKING AREA USAF PROJECT 77-0054 REPLACE JOINT SEALS, AIRCRAFT PARKING APRON PROJECT KE-83-0007
A15B	AIRCRAFT WASHRACK	1945 1969 1974	6/9.0 PCC	9/6/6/9" PCC, COE SEALDED JOINTS, PROJECT KE-96-9 12 SLABS REPLACED WITH 7" PCC WITH 1/4" REINFORCING
A16B	PARKING APRON 2 (ROADWAY)	1942 1969 1982	6/8.0 PCC	8/6/6/8" PCC, COE SEALED JOINTS, PROJECT KE-96-9 ROUTE SEAL APRON AND RUNWAY JOINTS
A17B	RUNWAY APRON 2 (ROADWAY)	1942 1975	6/8.0 PCC 4.0 AC	8/6/6/8" PCC, COE OVERLAY
A18B	PARKING APRON 2	1942 1962 1969 1974	6/8.0 PCC 6.0 PCC	8/6/6/8" PCC, COE 77 SLABS REPLACED WITH 8" PCC REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2 SEALED JOINTS, PROJECT KE-96-9 OVERLAY, US NAVY, PROJECT N62467-74-C-008
A19B	PARKING APRON 3 - TRANSITION	1952 1969 1977 1979 UNK	8.0 PCC 9.0 PCC 9.0 PCC AC	COE SEALED JOINTS, PROJECT KE-96-9 REMOVE/REPLACE 5 PCC SLABS, PROJECT KE-77-0054 REMOVE/REPLACE 5 PCC SLABS AT CATCH BASIN PROJECT KE-79-0043 TRANSITION TO OLD RAMP PAVEMENT
A20 B	PARKING APRON 3	1952 1969 1977 1979	8.0 PCC 9.0 PCC 9.0 PCC	COE SEALED JOINTS, PROJECT KE-96-9 REMOVE/REPLACE 5 PCC SLABS, PROJECT KE-77-0054 REMOVE/REPLACE 5 PCC SLABS AT CATCH BASIN PROJECT KE-79-0043
A21B	NORTH WARMUP APRON	1973	8.0 PCC	US NAVY PROJECT N62467-72-C-0398
A22C	HANGER APRON	1942 1962 1969 1981 1982 1986 1988*	6/8.0" PCC 6.0 PCC 9.0 PCC 9.0 PCC	8/6/6/8.0" PCC, COE 38 SLABS REPLACED WITH 8" PCC, REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2 SEAL JOINTS, PROJECT KE-96-9 REPAIR REPLACE BROKEN PCC SLABS, KE-79-0024 ROUTE SEAL APRON AND RUNWAY JOINTS PROJRCT KE-82-0006 SLAB REPLACEMENT APPROX 20% REPLACED KE-83-0008, 86-0031, 86-0031 SLAB REPLACEMENT APPROX 10% REPLACED PROJECT KE-87-0024
A23B	MAINTENANCE APRON			

CONSTRUCTION HISTORY
KEESLER AFB, MISSISSIPPI

FEATURE	DESIGNATION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (IN)	
A24C	HANGER APRON	1942	6/8.0" PCC	8/6/6/8.0" PCC, COE
		1962		38 SLABS REPLACED WITH 8" PCC, REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2
		1969		SEAL JOINTS, PROJECT KE-96-9
		1981	6.0 PCC	REPAIR REPLACE BROKEN PCC SLABS, KE-79-0024
		1982		ROUTE SEAL APRON AND RUNWAY JOINTS PROJRCT KE-82-0006
		1986	9.0 PCC	SLAB REPLACEMENT APPROX 20% REPLACED KE-83-0008, 86-0031, 86-0031
		1988*	9.0 PCC	SLAB REPLACEMENT APPROX 10% REPLACED PROJECT KE-87-0024
A25B	HANGER APRON	1942	6/8.0" PCC	8/6/6/8.0" PCC, COE
		1962		38 SLABS REPLACED WITH 8" PCC, REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2
		1969		SEAL JOINTS, PROJECT KE-96-9
		1981	6.0 PCC	REPAIR REPLACE BROKEN PCC SLABS, KE-79-0024
		1982		ROUTE SEAL APRON AND RUNWAY JOINTS PROJRCT KE-82-0006
		1986	9.0 PCC	SLAB REPLACEMENT APPROX 20% REPLACED KE-83-0008, 86-0031, 86-0031
		1988*	9.0 PCC	SLAB REPLACEMENT APPROX 10% REPLACED PROJECT KE-87-0024
A26A	MAINTENANCE APRON TAXI-WAY			
A27B	ALPHA APRON SOUTH SPOT-12	1942	6/8.0 PCC	8/6/6/8" PCC, COE
		1962		77 SLABS REPLACED WITH 8" PCC REINFORCED WITH 6"X6"X#5 WWF, PROJECT KE-68-2
		1969		SEALED JOINTS, PROJECT KE-96-9
		1974	6.0 PCC	OVERLAY, US NAVY, PROJECT N62467-74-C-008

SUMMARY OF ALLOWABLE GROSS LOADS
KEESLER AFB, MISSISSIPPI
Non-Frost Period

		PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS													
FEATURE NAME	PASS INTENSITY LEVEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A01B	I	+	+	+	+	+	+	186	370	347	520	822	+	+	291
	II	+	+	+	+	+	+	207	+	388	575	+	+	+	340
	III	+	+	+	+	+	+	+	+	461	+	+	+	+	417
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A02B	I	12	11	A	A	31	A	A	A	A	A	A	A	A	A
	II	14	13	A	A	34	A	A	A	A	A	A	A	A	A
	III	16	14	A	A	39	A	A	A	A	A	A	A	A	A
	IV	18	16	A	77	50	A	A	A	A	A	377	A	A	A
A03B	I	+	+	+	+	+	+	178	363	340	507	810	+	866	284
	II	+	+	+	+	+	+	199	+	380	561	+	+	+	331
	III	+	+	+	+	+	+	+	+	451	+	+	+	+	406
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A04B	I	+	27	A	95	65	67	A	150	146	A	469	A	A	A
	II	+	32	A	105	72	74	A	166	161	A	518	270	A	A
	III	+	35	A	120	82	84	A	189	184	314	592	341	498	A
	IV	+	40	A	151	104	106	120	238	231	396	746	426	621	276
A05B	I	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	II	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A06B	I	+	+	+	+	+	+	195	369	347	519	806	+	+	294
	II	+	+	+	+	+	+	+	+	388	574	+	+	+	344
	III	+	+	+	+	+	+	+	+	460	+	+	+	+	422
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A07A	I	+	+	+	+	+	+	+	+	401	+	+	+	+	341
	II	+	+	+	+	+	+	+	+	445	+	+	+	+	396
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A08B	I	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	II	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A10B	I	+	45	56	140	87	90	100	227	218	304	530	381	535	A
	II	+	52	65	156	97	100	112	253	244	336	583	451	633	A
	III	+	59	73	+	116	119	133	301	289	392	674	568	796	251
	IV	+	72	88	+	+	+	168	380	365	480	814	+	+	315
A12A	I	+	48	57	129	84	86	96	202	189	287	472	353	492	A
	II	+	56	66	143	94	96	106	225	210	317	519	416	579	A
	III	+	62	73	169	110	113	125	264	247	367	598	518	720	A
	IV	+	75	87	+	+	141	155	329	307	446	719	+	+	282

SUMMARY OF ALLOWABLE GROSS LOADS
KEESLER AFB, MISSISSIPPI
Non-Frost Period

		PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS													
FEATURE NAME	**PASS INTENSITY LEVEL**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
A14B	I	+	+	+	+	+	+	170	351	329	489	787	+	838	273
	II	+	+	+	+	+	+	190	+	367	541	+	+	+	319
	III	+	+	+	+	+	+	+	+	436	+	+	+	+	391
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A15B	I	+	43	A	129	81	84	A	208	198	281	480	352	493	A
	II	+	50	62	144	91	93	104	233	221	311	528	417	583	A
	III	+	57	69	172	108	111	124	277	262	362	610	525	732	A
	IV	+	69	83	+	+	140	156	349	331	443	738	+	+	288
A17B	I	+	52	60	144	94	96	106	238	227	317	542	397	560	A
	II	+	61	70	162	105	107	119	266	253	350	597	471	663	A
	III	+	69	79	+	+	128	141	316	301	408	690	+	833	259
	IV	+	+	94	+	+	+	177	+	380	500	834	+	+	326
A18B	I	+	75	87	+	+	134	147	309	289	429	696	532	738	240
	II	+	+	+	+	+	150	164	345	323	474	766	+	+	279
	III	+	+	+	+	+	+	195	+	384	552	+	+	+	343
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	431
A19B	I	+	+	+	+	+	+	185	+	412	559	+	+	+	327
	II	+	+	+	+	+	+	207	+	461	+	+	+	+	381
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	468
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A20B	I	+	43	A	128	81	83	A	208	197	280	479	351	492	A
	II	+	50	61	144	91	93	104	232	220	310	527	416	582	A
	III	+	57	69	172	108	111	123	276	261	361	608	524	730	A
	IV	+	68	83	+	+	140	156	348	330	442	736	+	+	287
A21B	I	+	+	+	+	+	+	174	364	340	504	818	+	869	282
	II	+	+	+	+	+	+	194	+	381	558	+	+	+	329
	III	+	+	+	+	+	+	+	+	452	+	+	+	+	404
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A22C	I	24	22	A	72	44	A	A	A	A	A	A	A	A	A
	II	+	26	A	81	50	A	A	A	A	A	A	A	A	A
	III	+	29	A	96	59	61	A	155	150	A	A	292	A	A
	IV	+	35	A	123	75	77	A	196	190	A	426	380	533	A
A23B	I	+	+	96	+	+	144	157	312	292	440	695	540	745	246
	II	+	+	+	+	+	+	175	349	327	486	765	+	+	287
	III	+	+	+	+	+	+	208	+	388	566	+	+	+	352
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	443
A24C	I	+	36	A	120	73	76	A	194	188	A	463	322	457	A
	II	+	42	54	134	82	85	96	216	211	287	510	382	540	A
	III	+	47	61	160	97	101	113	257	250	335	589	481	679	A
	IV	+	57	73	+	+	127	143	324	316	410	712	+	+	274

SUMMARY OF ALLOWABLE GROSS LOADS
KEESLER AFB, MISSISSIPPI
Non-Frost Period

FEATURE NAME	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
A25B	I	+	56	67	154	100	102	113	241	226	334	547	415	577	A
	II	+	66	78	173	112	115	127	270	252	369	602	492	683	A
	III	+	74	87	+	+	136	150	320	299	429	695	+	857	267
	IV	+	+	+	+	+	+	189	+	378	526	+	+	+	336
A26A	I	+	79	89	+	+	132	145	289	270	416	662	505	700	232
	II	+	+	+	+	+	147	161	321	300	459	728	+	823	270
	III	+	+	+	+	+	+	189	377	353	532	+	+	+	329
	IV	+	+	+	+	+	+	+	+	438	+	+	+	+	410
A27B	I	+	74	86	+	+	136	150	333	313	447	753	558	784	253
	II	+	+	100	+	+	+	168	372	350	494	829	+	+	295
	III	+	+	+	+	+	+	199	+	415	575	+	+	+	362
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	455
R01A	I	+	65	85	+	+	132	149	320	302	461	770	551	768	259
	II	+	76	98	+	+	147	166	356	336	508	+	+	+	300
	III	+	+	+	+	+	+	195	+	395	+	+	+	+	366
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	456
R02C	I	20	17	A	100	55	A	A	A	A	A	450	A	A	A
	II	22	19	A	108	59	A	A	140	A	A	485	A	A	A
	III	24	20	A	119	65	66	A	154	150	292	535	291	A	A
	IV	26	23	A	147	80	82	100	190	185	362	661	364	501	236
R03A	I	+	+	95	+	+	143	157	319	298	457	736	558	774	255
	II	+	+	+	+	+	+	174	355	332	504	808	+	+	296
	III	+	+	+	+	+	+	204	+	390	+	+	+	+	361
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	450
R04A	I	+	47	60	162	108	112	127	250	240	396	676	401	579	254
	II	+	54	68	+	118	122	138	273	262	452	+	452	652	287
	III	+	59	75	+	+	137	156	308	295	509	+	566	817	359
	IV	+	66	84	+	+	+	195	+	370	+	+	+	+	448
R05C	I	+	43	58	163	109	111	128	252	247	433	809	386	561	254
	II	+	48	65	+	117	120	138	271	266	467	+	426	619	280
	III	+	52	70	+	+	132	152	299	293	515	+	527	766	347
	IV	+	57	77	+	+	+	188	370	363	+	+	+	+	433
R06C	I	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	II	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
R07C	I	+	29	A	127	81	83	97	190	186	334	621	295	424	A
	II	+	33	A	137	88	90	105	205	201	362	672	327	472	A
	III	+	35	A	153	98	100	117	228	224	402	747	407	586	269
	IV	+	39	59	+	122	124	146	283	278	500	+	508	732	336

SUMMARY OF ALLOWABLE GROSS LOADS
KEESLER AFB, MISSISSIPPI
Non-Frost Period

		PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS													
FEATURE NAME	PASS INTENSITY LEVEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14
R08C	I	+	53	68	+	+	131	149	296	289	500	+	453	660	296
	II	+	59	76	+	+	141	161	318	311	539	+	500	730	327
	III	+	64	82	+	+	+	178	352	343	+	+	+	+	404
	IV	+	70	91	+	+	+	+	+	425	+	+	+	+	+
R09C	I	+	61	88	+	+	+	190	379	372	+	+	559	830	370
	II	+	81	97	+	+	+	203	+	397	+	+	+	+	404
	III	+	+	+	+	+	+	+	+	434	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
R10A	I	+	+	94	+	+	140	153	310	290	445	712	542	751	248
	II	+	+	+	+	+	+	170	344	322	490	782	+	+	288
	III	+	+	+	+	+	+	200	+	378	568	+	+	+	351
	IV	+	+	+	+	+	+	+	+	470	+	+	+	+	438
R11C	I	20	17	A	89	53	A	A	A	A	A	416	A	A	A
	II	22	19	A	96	57	A	A	A	A	A	452	A	A	A
	III	24	21	A	108	64	65	A	150	146	A	505	275	A	A
	IV	+	24	A	134	80	81	97	186	182	341	629	343	484	A
R12A	I	+	+	100	+	+	+	168	356	332	502	824	+	862	281
	II	+	+	+	+	+	+	187	+	370	554	+	+	+	326
	III	+	+	+	+	+	+	+	+	434	+	+	+	+	397
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+
T01A	I	+	81	91	+	+	136	148	294	275	424	674	514	713	237
	II	+	+	+	+	+	+	165	327	306	468	740	+	838	275
	III	+	+	+	+	+	+	194	+	360	542	+	+	+	336
	IV	+	+	+	+	+	+	+	+	447	+	+	+	+	418
T02C	I	+	28	A	114	76	78	A	178	174	304	568	279	A	A
	II	+	33	A	126	84	86	99	196	191	335	625	317	461	A
	III	+	36	A	143	95	98	113	222	217	381	710	399	581	262
	IV	+	41	58	+	120	123	142	280	273	479	+	498	725	327
T03C	I	11	10	A	A	30	A	A	A	A	A	A	A	A	A
	II	13	11	A	A	33	A	A	A	A	A	A	A	A	A
	III	14	12	A	A	38	A	A	A	A	A	A	A	A	A
	IV	16	14	A	80	47	A	A	A	A	A	A	A	A	A
T04C	I	+	30	A	127	82	84	98	191	188	336	624	297	429	A
	II	+	34	A	138	89	91	106	207	203	364	677	331	478	A
	III	+	36	A	153	99	101	118	231	226	406	754	412	595	272
	IV	+	41	59	+	+	126	147	288	282	505	+	515	743	340
T05A	I	+	+	+	+	+	+	+	+	+	+	+	+	+	478
	II	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	III	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+

SUMMARY OF ALLOWABLE GROSS LOADS
KEESLER AFB, MISSISSIPPI
Non-Frost Period

		PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS													
FEATURE NAME	**PASS INTENSITY LEVEL**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
T06C	I	+	44	A	142	105	107	120	239	236	394	742	353	527	236
	II	+	50	60	154	114	116	130	259	256	427	804	393	587	263
	III	+	54	65	171	+	130	144	288	285	475	+	489	731	327
	IV	+	60	72	+	+	+	180	359	354	+	+	+	+	408
T07A	I	+	24	A	97	68	71	A	149	149	A	409	A	A	A
	II	+	35	A	107	80	82	A	184	181	298	520	286	431	A
	III	+	41	A	122	90	94	104	210	206	338	638	360	542	238
	IV	+	46	A	153	114	118	130	264	259	425	802	449	677	297
T08A	I	+	35	A	152	96	100	118	212	211	341	569	360	524	237
	II	+	43	61	163	108	111	128	252	247	434	724	396	575	260
	III	+	46	65	+	119	122	141	278	272	478	+	488	709	321
	IV	+	51	72	+	+	150	174	342	335	+	+	+	+	401
T09A	I	+	61	72	164	107	110	122	262	244	368	611	453	635	A
	II	+	71	83	+	119	122	135	291	272	406	671	533	747	239
	III	+	80	93	+	+	144	159	342	320	471	773	+	+	292
	IV	+	+	+	+	+	+	197	+	397	572	+	+	+	363
T10C	I	12	11	A	A	31	A	A	A	A	A	A	A	A	A
	II	14	12	A	A	34	A	A	A	A	A	A	A	A	A
	III	15	14	A	A	38	A	A	A	A	A	A	A	A	A
	IV	17	15	A	76	48	A	A	A	A	A	A	A	A	A
T12C	I	+	40	A	148	98	102	117	226	224	343	580	360	524	233
	II	+	45	61	160	107	110	126	250	243	422	738	401	584	260
	III	+	49	66	+	119	123	141	279	271	470	+	499	727	324
	IV	+	54	73	+	+	+	175	347	337	+	+	+	+	404

PAVEMENT CLASSIFICATION NUMBERS*
KEESLER AFB, MISSISSIPPI
Non-Frost Period

FEATURE	PCN	FEATURE	PCN	FEATURE	PCN	FEATURE	PCN
A01B	**43/R/C/W/T**	R10A	**36/R/C/W/T**				
A02B	**2/F/C/W/T**	R11C	**14/F/B/W/T**				
A03B	**42/R/C/W/T**	R12A	**42/R/C/W/T**				
A04B	**20/F/C/W/T**	T01A	**34/R/C/W/T**				
A05B	**143/F/B/W/T**	T02C	**24/F/B/W/T**				
A06B	**43/R/C/W/T**	T03C	**2/F/B/W/T**				
A07A	**52/R/C/W/T**	T04C	**27/F/B/W/T**				
A08B	**153/F/B/W/T**	T05A	**66/F/A/W/T**				
A10B	**23/R/C/W/T**	T06C	**34/F/B/W/T**				
A12A	**22/R/C/W/T**	T07A	**17/F/B/W/T**				
A14B	**40/R/C/W/T**	T08A	**26/F/A/W/T**				
A15B	**21/R/C/W/T**	T09A	**29/R/C/W/T**				
A17B	**25/R/C/W/T**	T10C	**2/F/B/W/T**				
A18B	**35/R/C/W/T**	T12C	**28/F/B/W/T**				
A19B	**47/R/C/W/T**						
A20B	**21/R/C/W/T**						
A21B	**42/R/B/W/T**						
A22C	**5/R/D/W/T**						
A23B	**36/R/C/W/T**						
A24C	**19/R/C/W/T**						
A25B	**26/R/C/W/T**						
A26A	**34/R/C/W/T**						
A27B	**37/R/C/W/T**						
R01A	**38/R/B/W/T**						
R02C	**17/F/B/W/T**						
R03A	**38/R/C/W/T**						
R04A	**35/F/B/W/T**						
R05C	**39/F/B/W/T**						
R06C	**197/F/B/W/T**						
R07C	**27/F/B/W/T**						
R08C	**47/F/B/W/T**						
R09C	**55/F/A/W/T**						

* BASED ON C-17 AIRCRAFT AT 50,000 PASSES.

UNDERSTANDING THE PCN CODE

EXAMPLE: 31/F/C/W/T

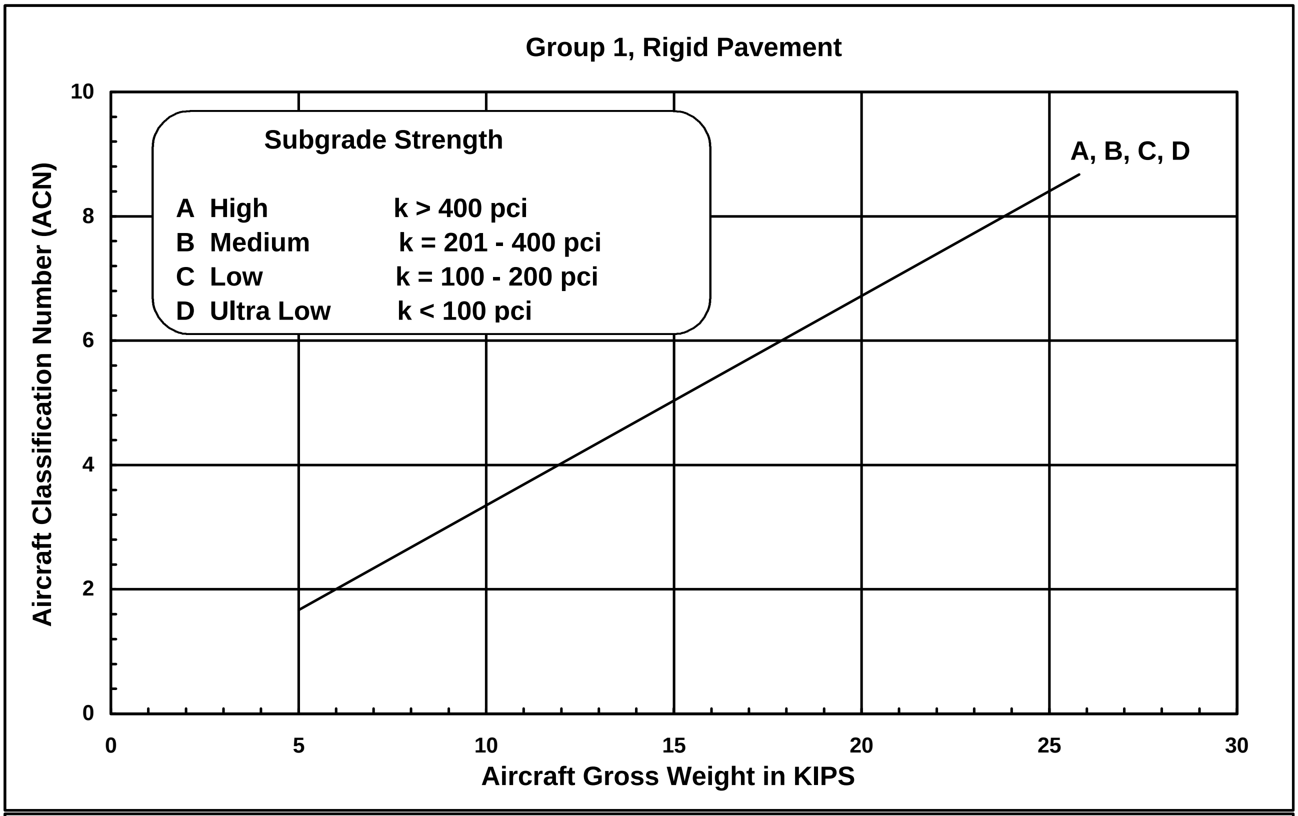
PCN NUMERIC VALUE	PAVEMENT TYPE	SUBGRADE STRENGTH	ALLOWABLE TIRE PRESSURE	METHOD OF PCN DETERMINATION
31	**F - FLEXIBLE**	A	**W**	**T - TECHNICAL EVALUATION**
	R - RIGID	B	X	U - USING AIRCRAFT
		C	Y	
		D	Z	

SUBGRADE STRENGTH CODES

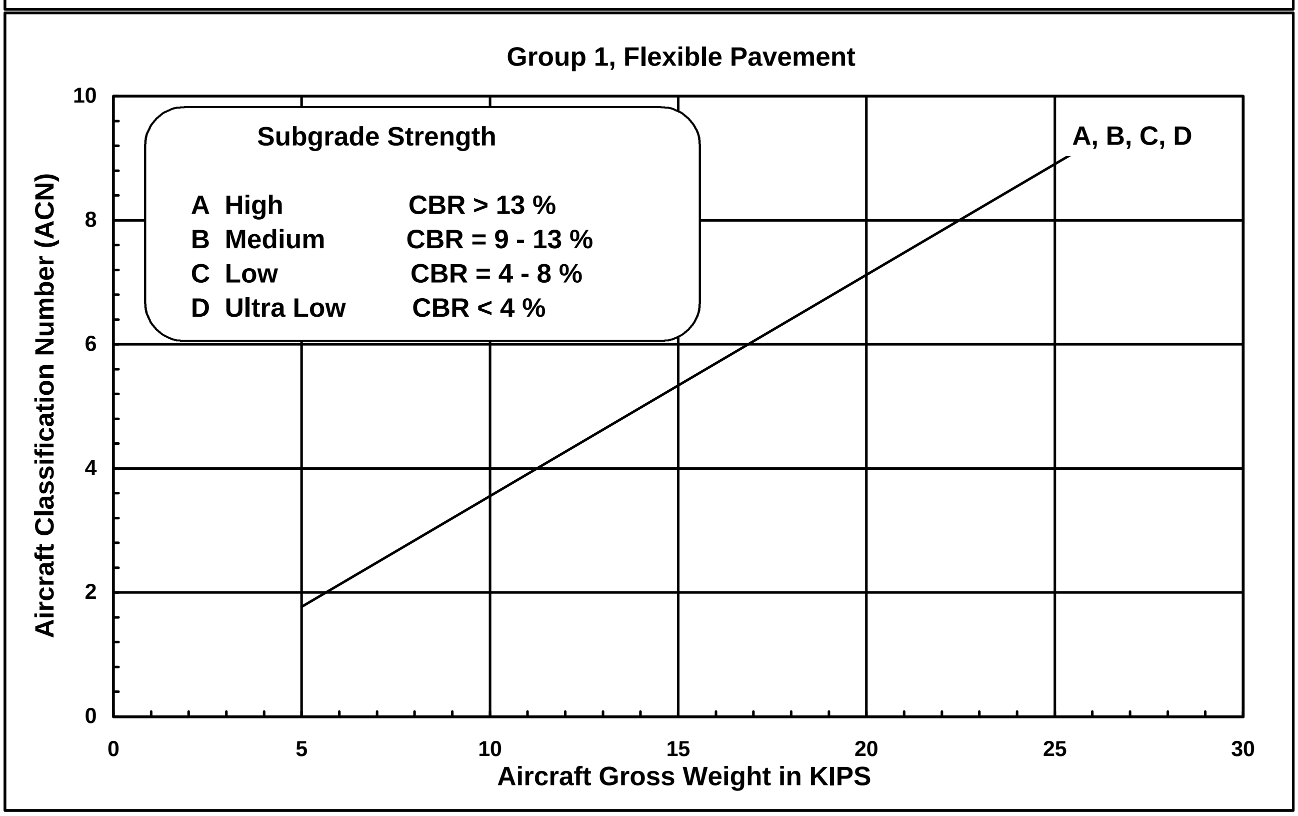
CODE	CATEGORY	FLEXIBLE PAVEMENT CBR (%)	RIGID PAVEMENT k (pci)
A	HIGH	OVER 13	OVER 400
B	MEDIUM	9-13	201 - 400
C	LOW	4-8	100 - 200
D	ULTRA LOW	< 4	< 100

TIRE PRESSURE CODES

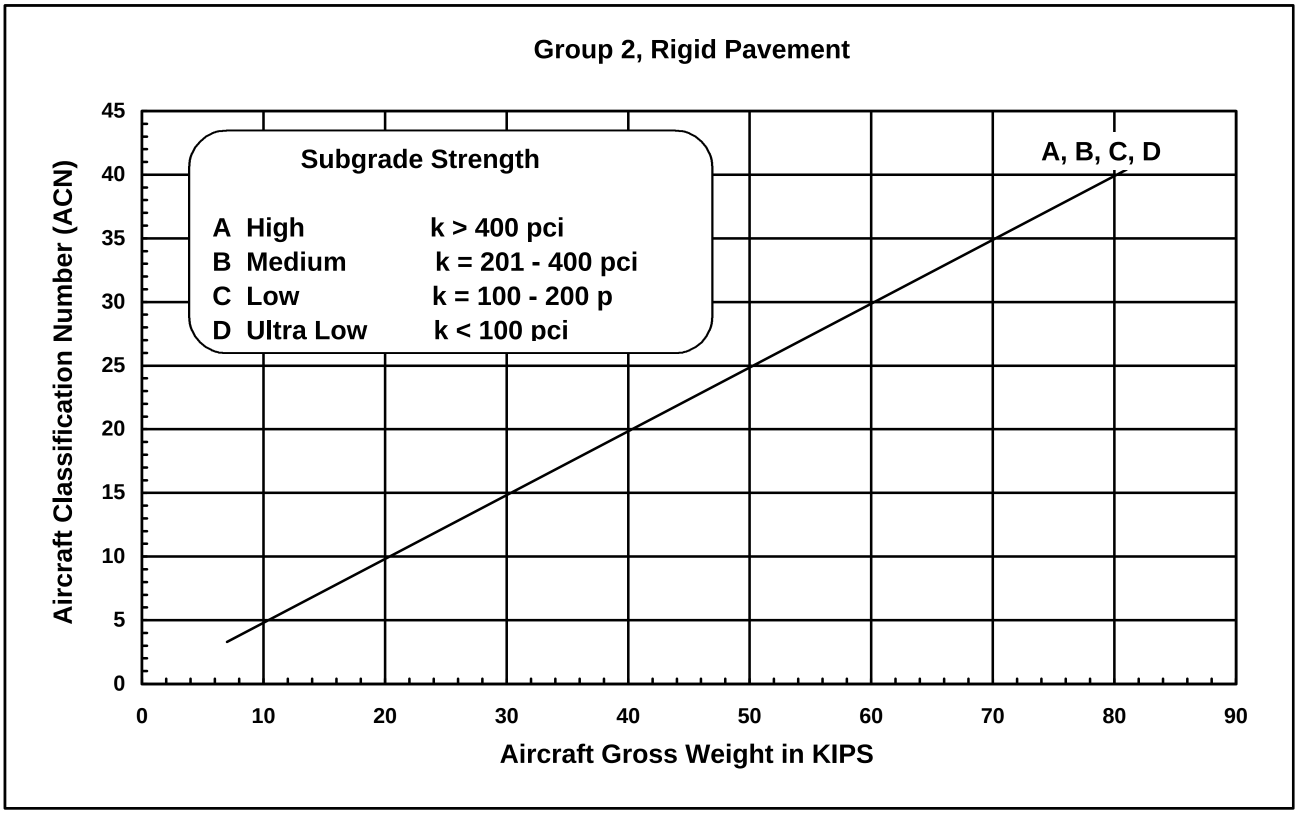
CODE	CATEGORY	ALLOWABLE TIRE PRESSURE, psi
W	HIGH	NO LIMIT
X	MEDIUM	146 - 217
Y	LOW	74 - 145
Z	ULTRA LOW	0 - 73

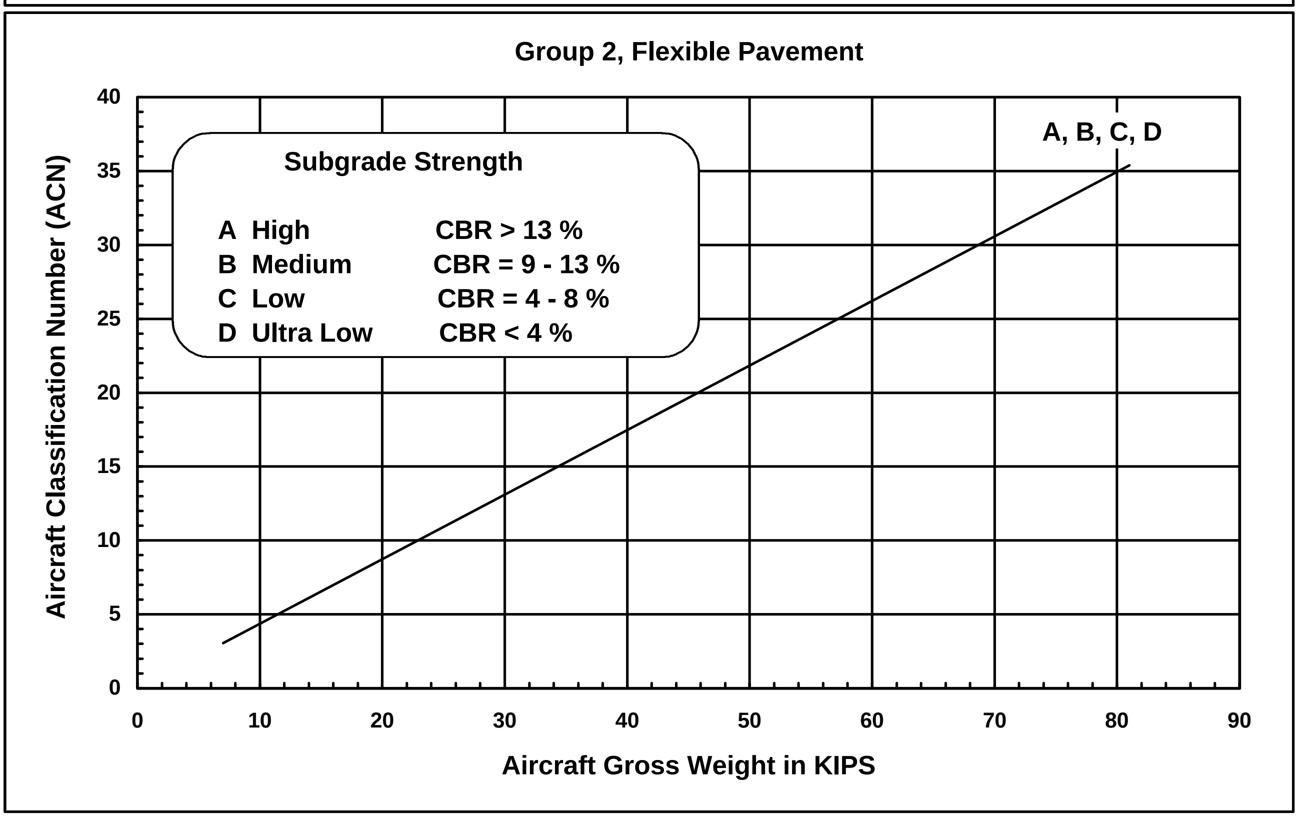


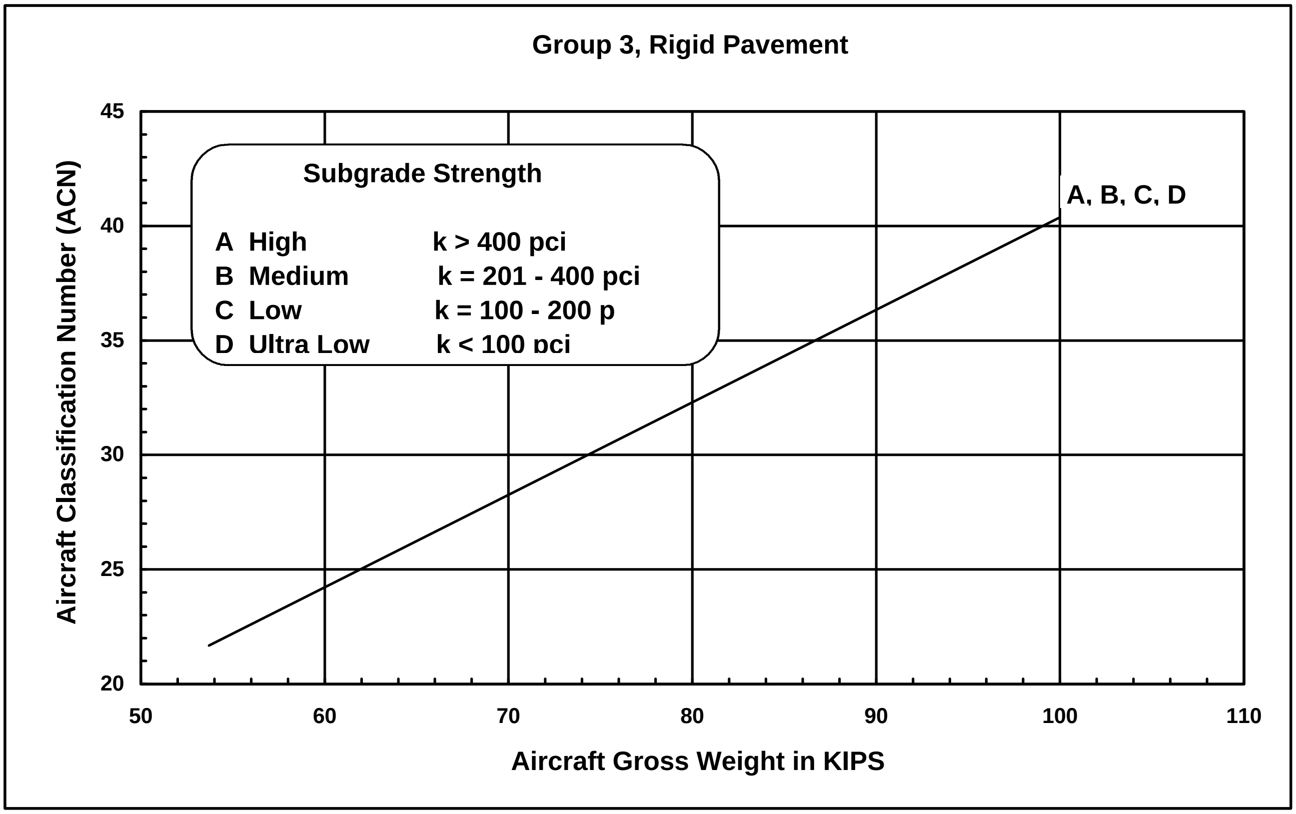
Group 1, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 pci
D Ultra Low k < 100 pci
A, B, C, D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
0 2 4 6 8 10
0 5 10 15 20 25 30

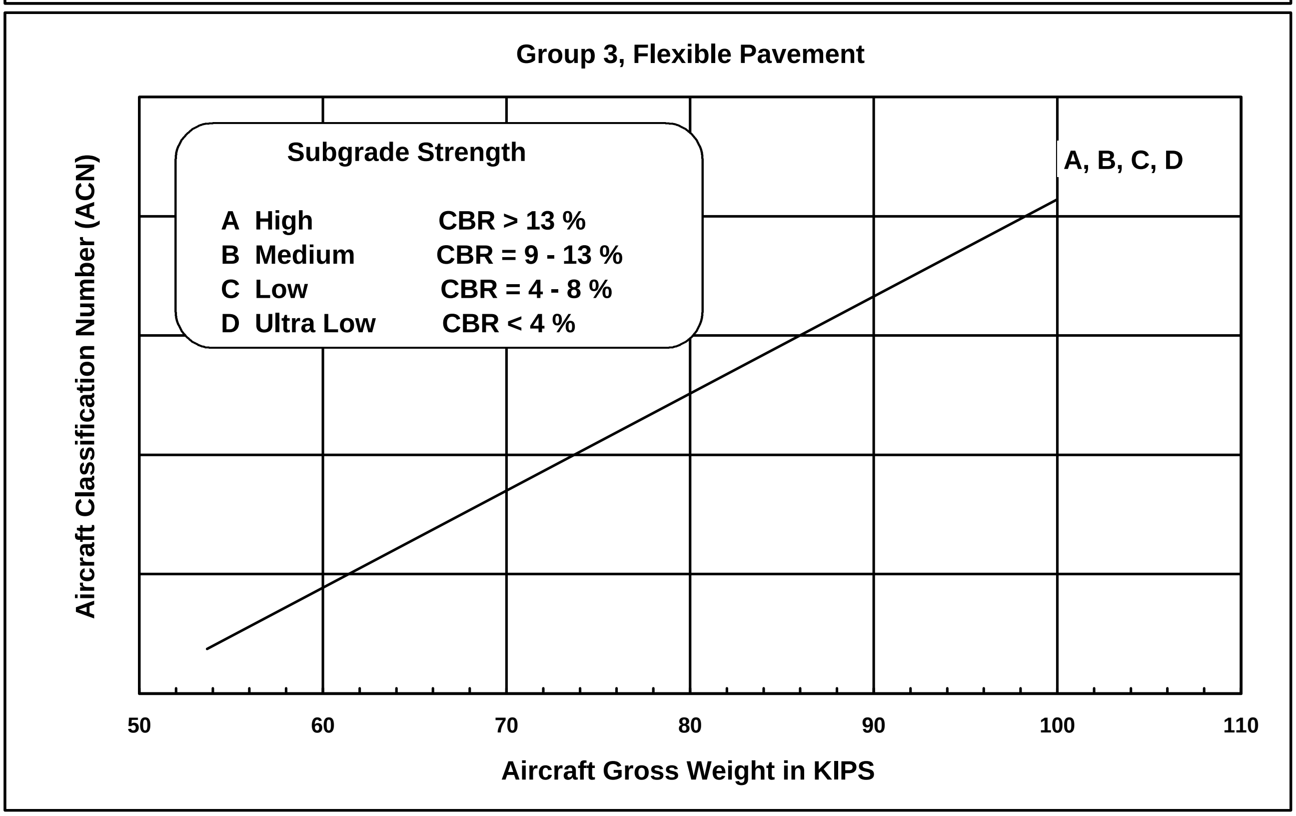


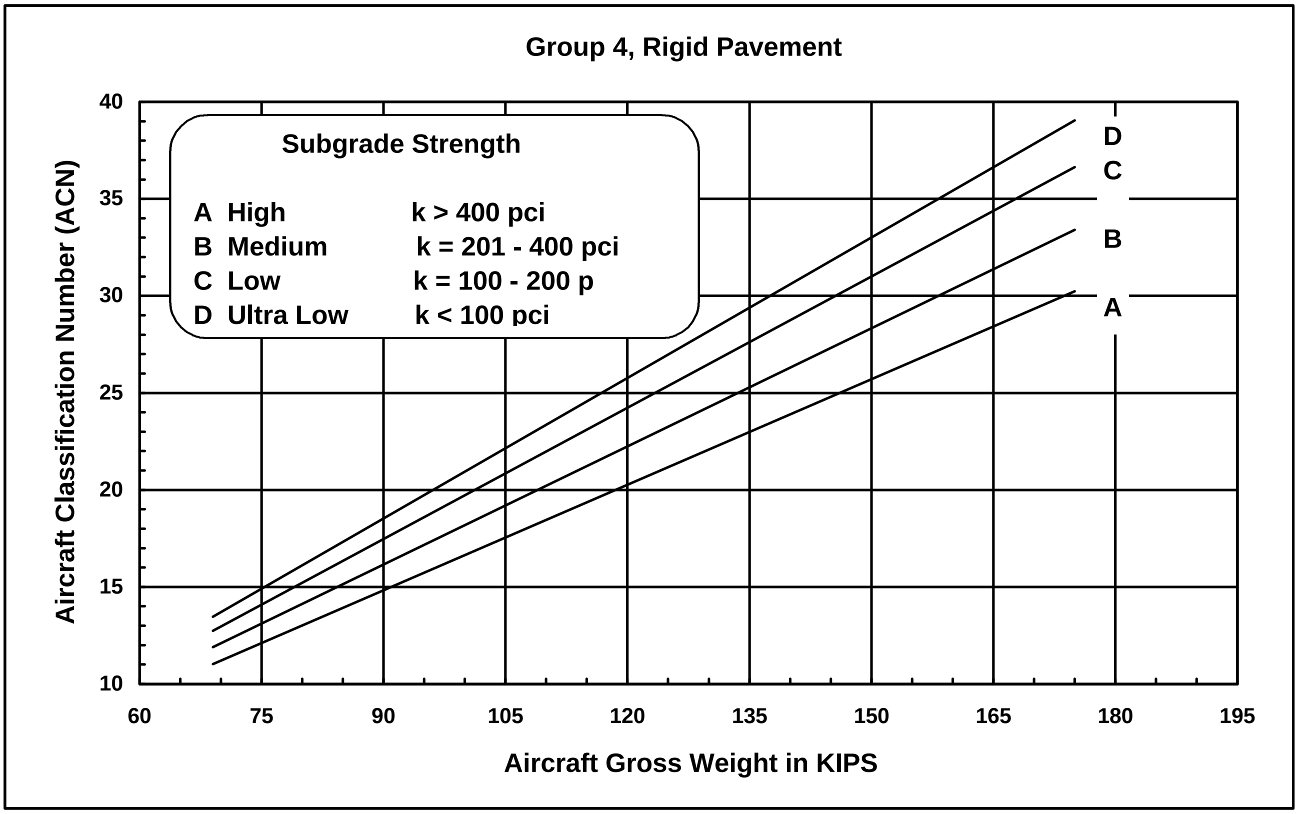
Group 1, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
A, B, C, D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
0 2 4 6 8 10
0 5 10 15 20 25 30

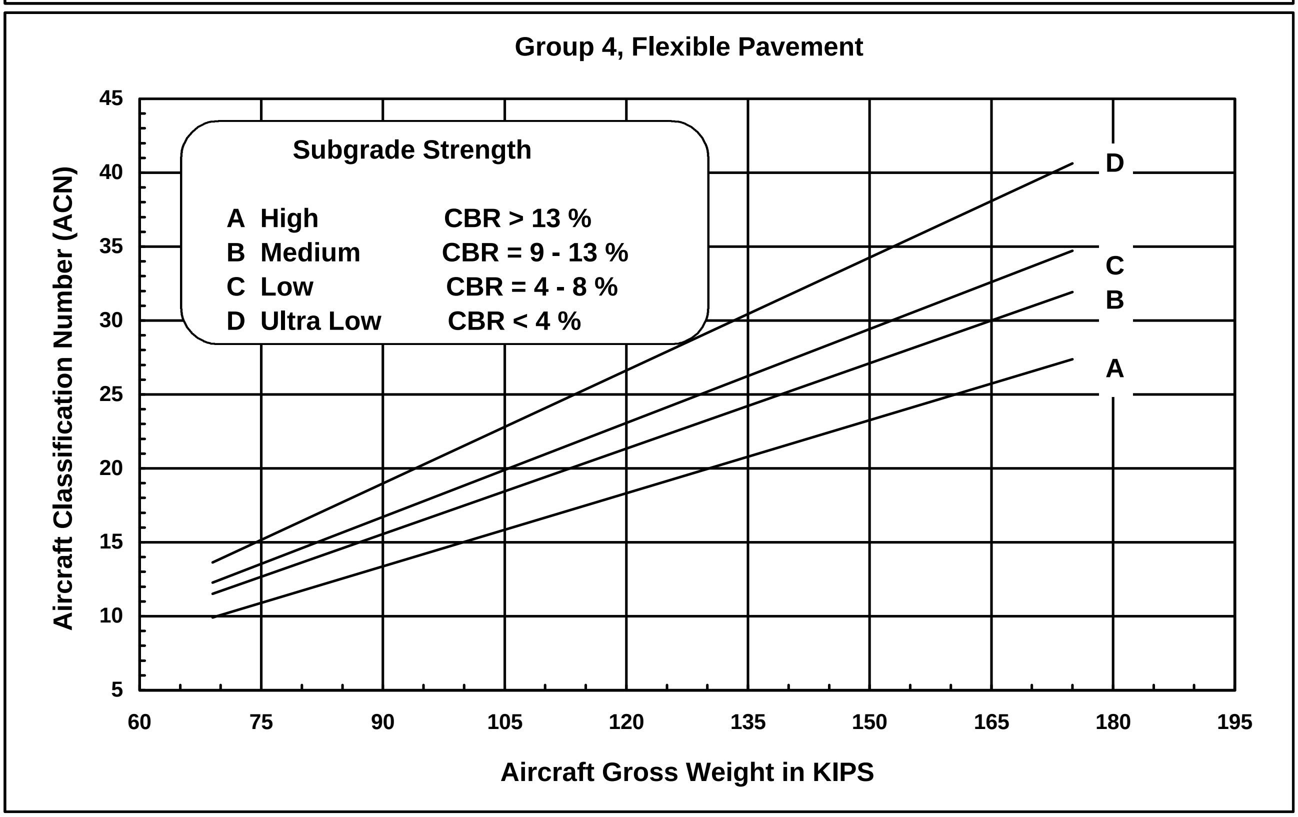

Group 2, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
A, B, C, D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
0 5 10 15 20 25 30 35 40 45
0 10 20 30 40 50 60 70 80 90

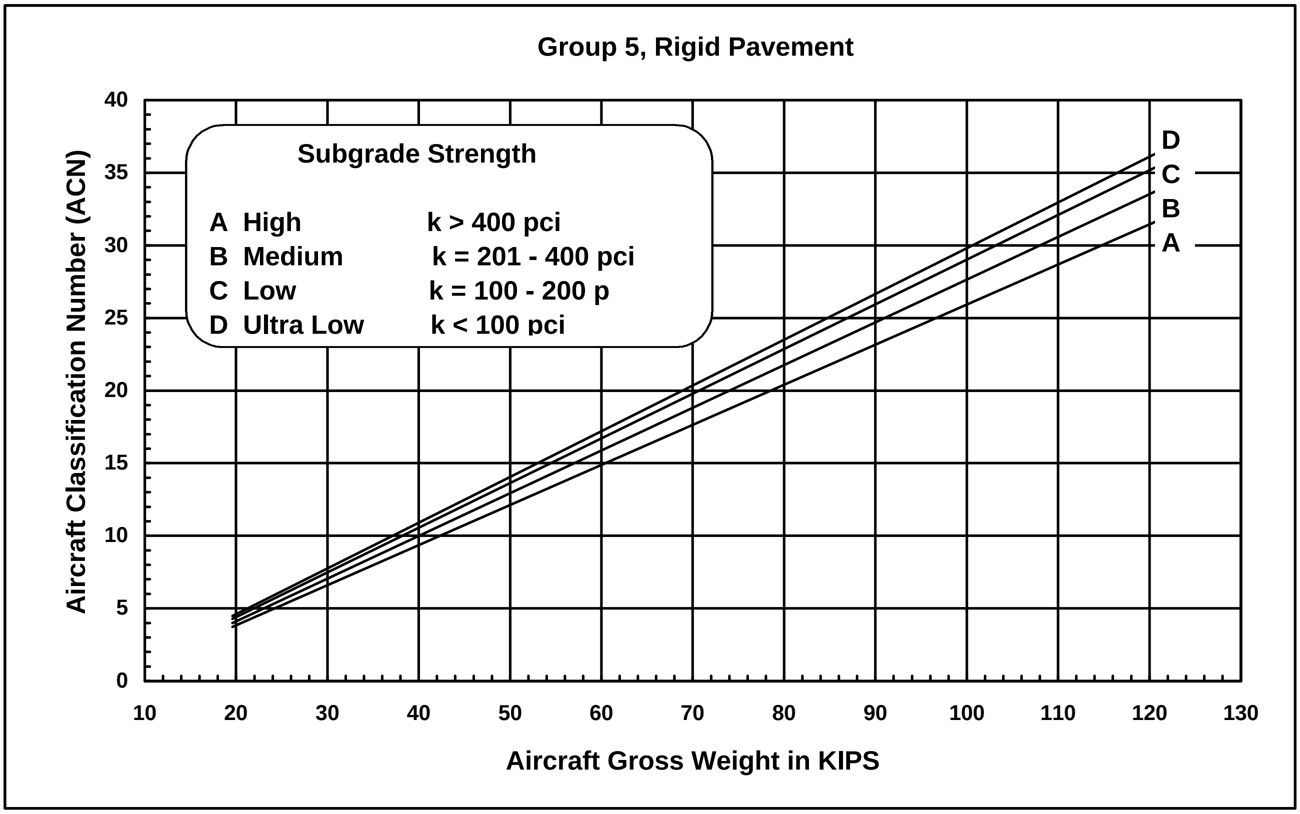

Group 2, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
A, B, C, D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
0 5 10 15 20 25 30 35 40
0 10 20 30 40 50 60 70 80 90

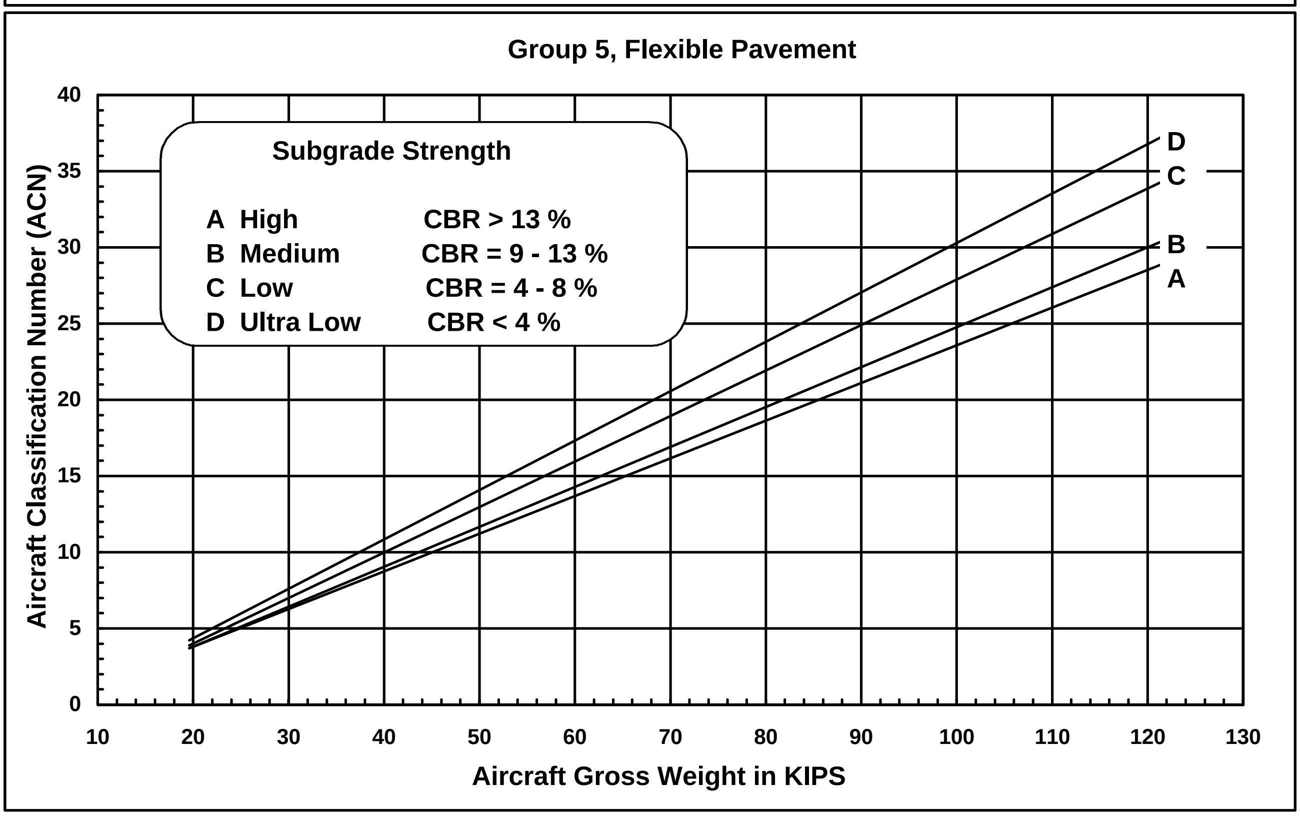

Group 3, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
A, B, C, D
45
40
35
30
25
20
50
60
70
80
90
100
110
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS

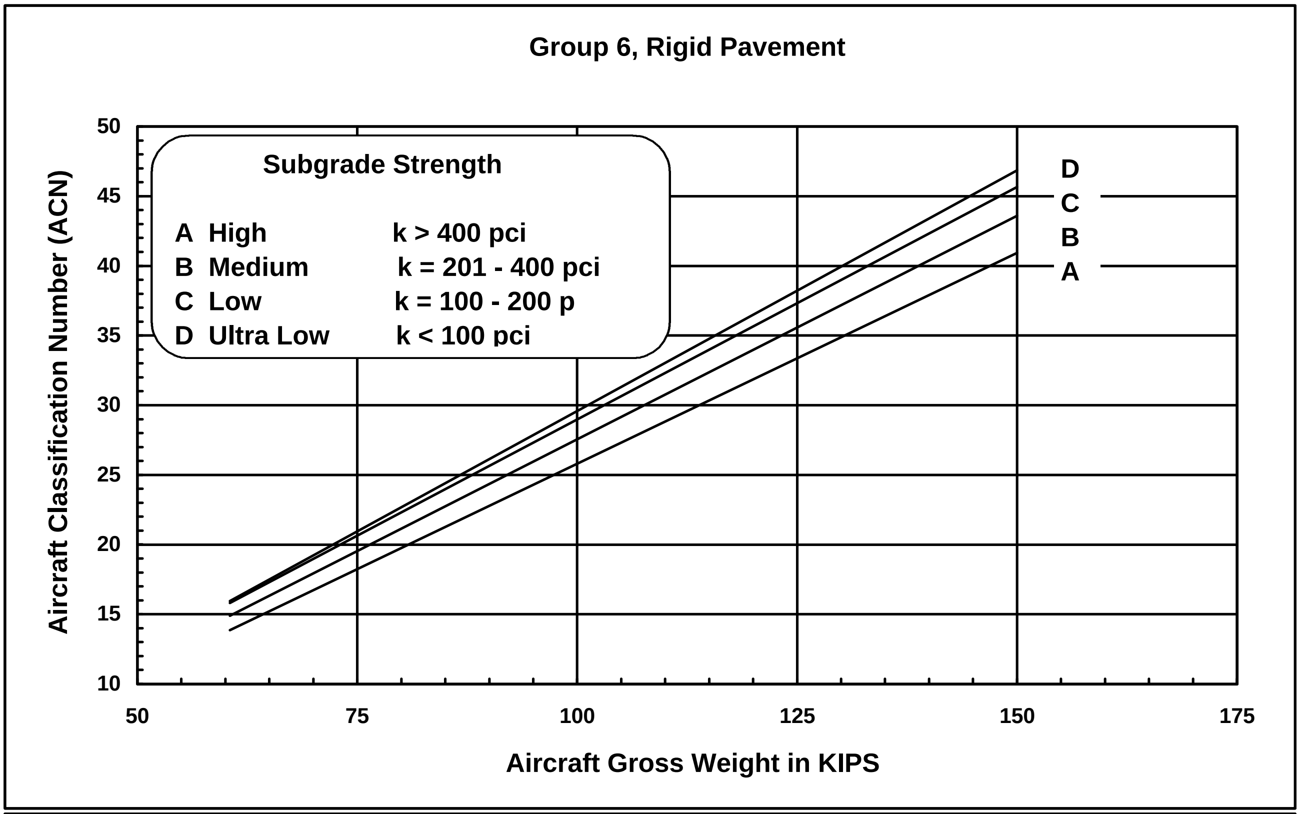

Group 3, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
A, B, C, D
50
60
70
80
90
100
110
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS

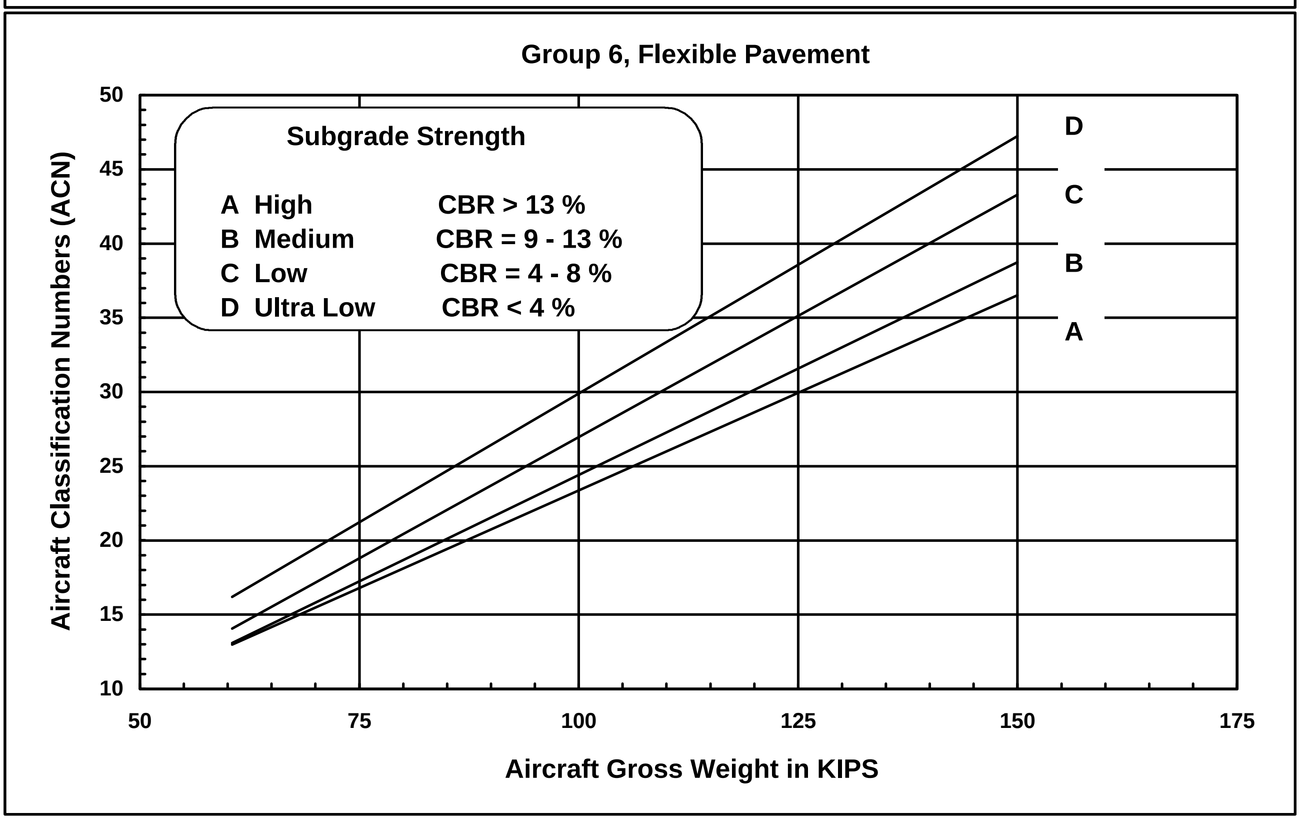

Group 4, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
10
15
20
25
30
35
40
60
75
90
105
120
135
150
165
180
195

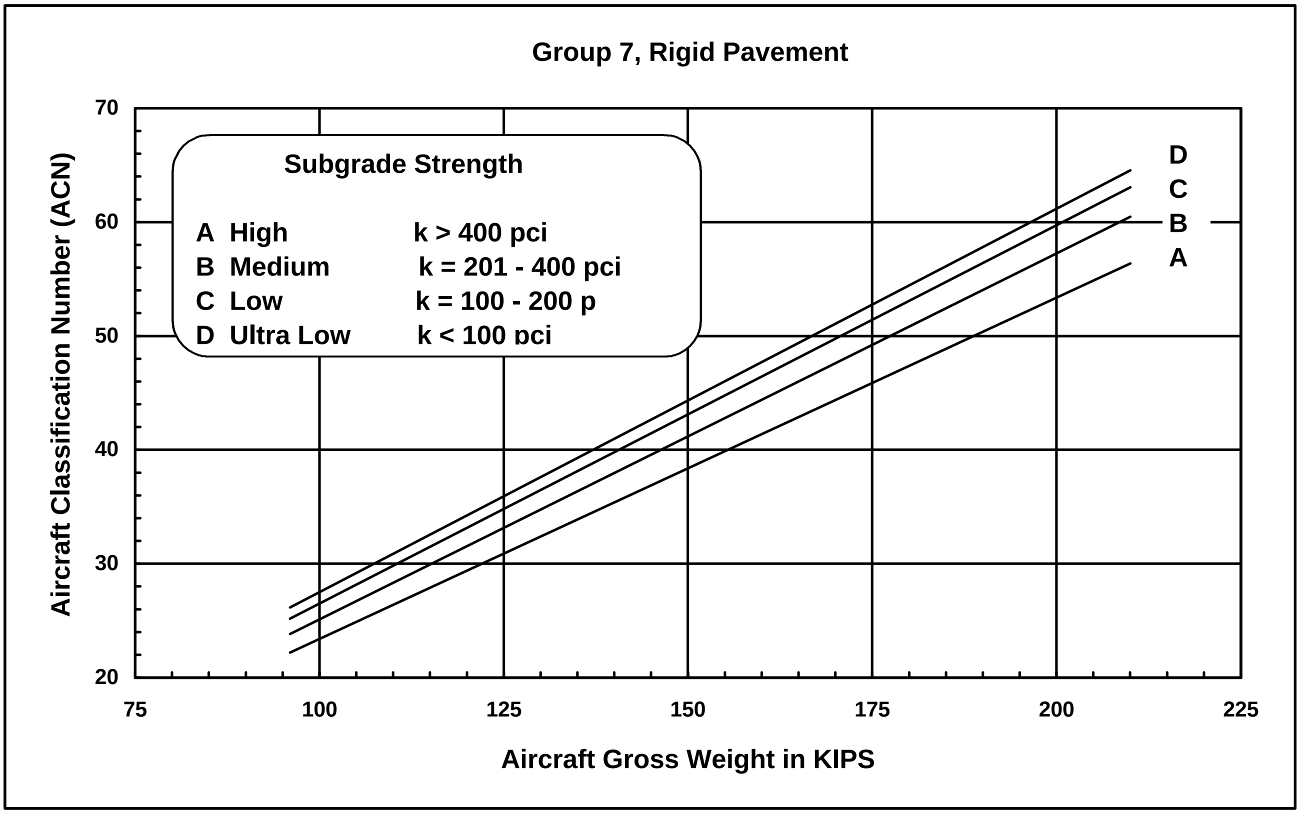

Group 4, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
5
10
15
20
25
30
35
40
45
60
75
90
105
120
135
150
165
180
195

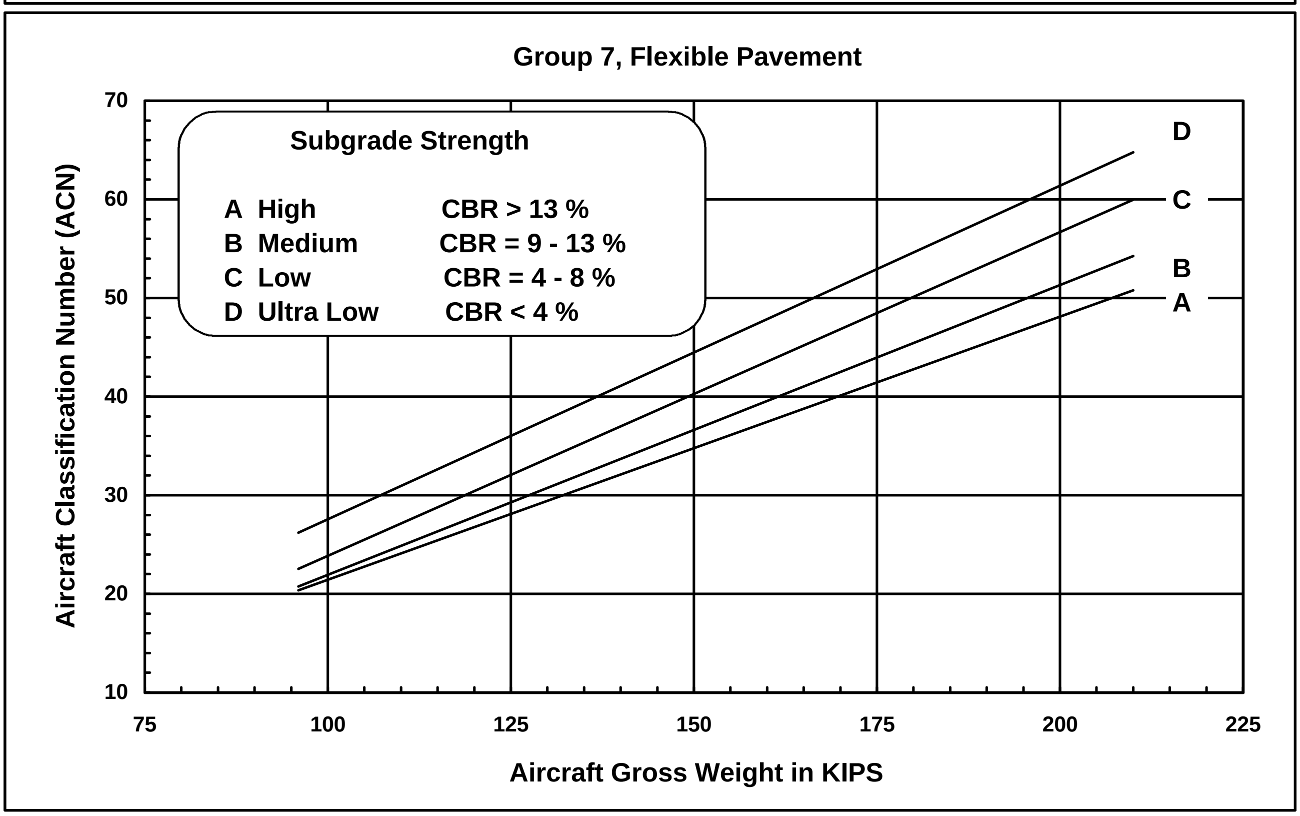

Group 5, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D

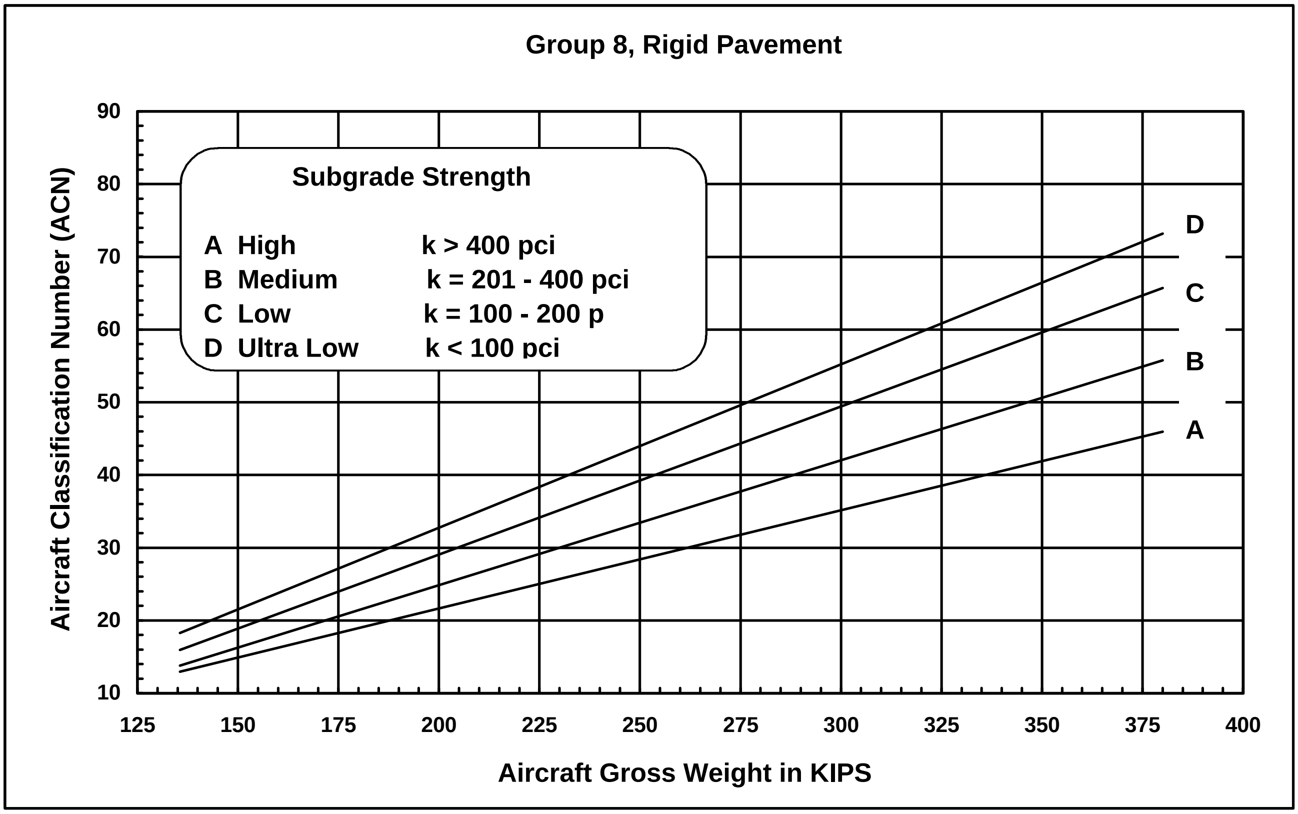

Group 5, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D

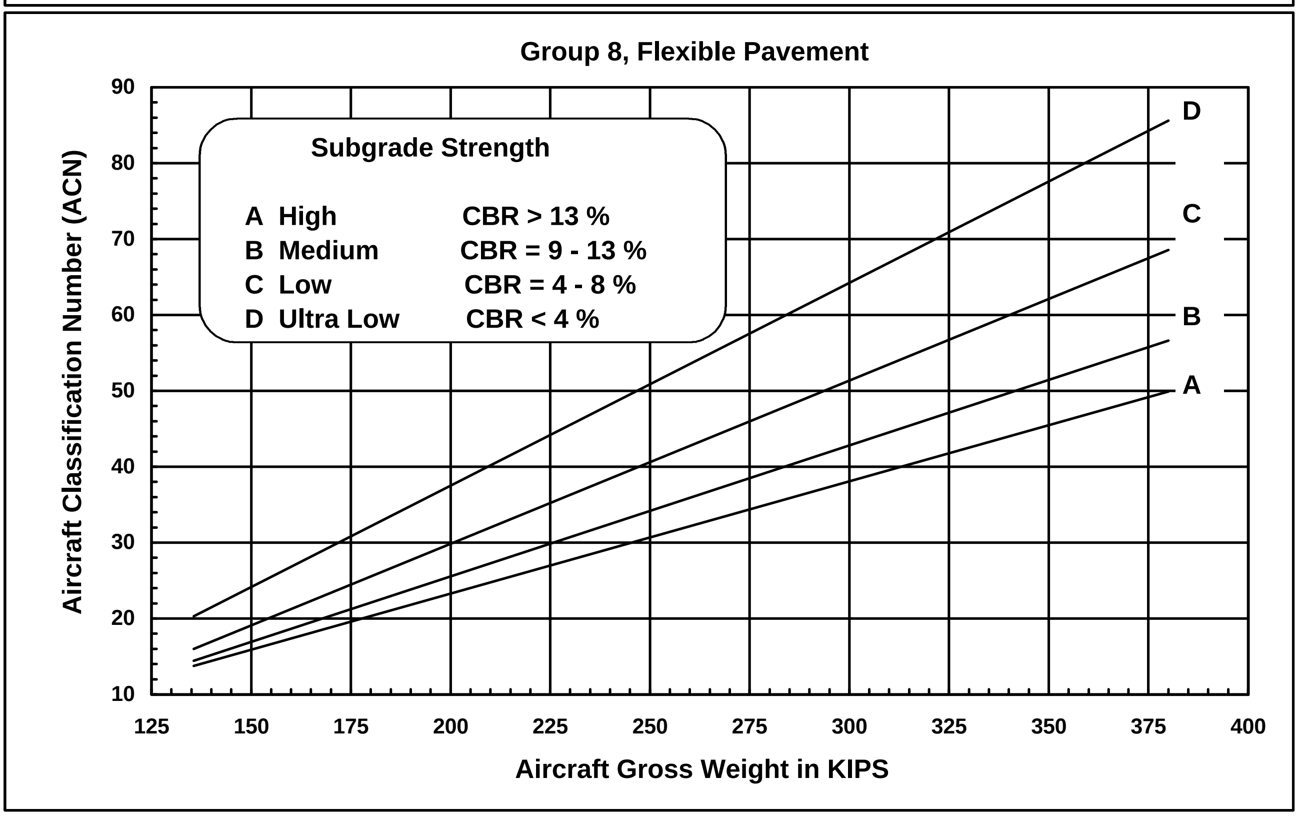

Group 6, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
D
C
B
A
Aircraft Classification Number (ACN)
50
45
40
35
30
25
20
15
10
50
75
100
125
150
175
Aircraft Gross Weight in KIPS

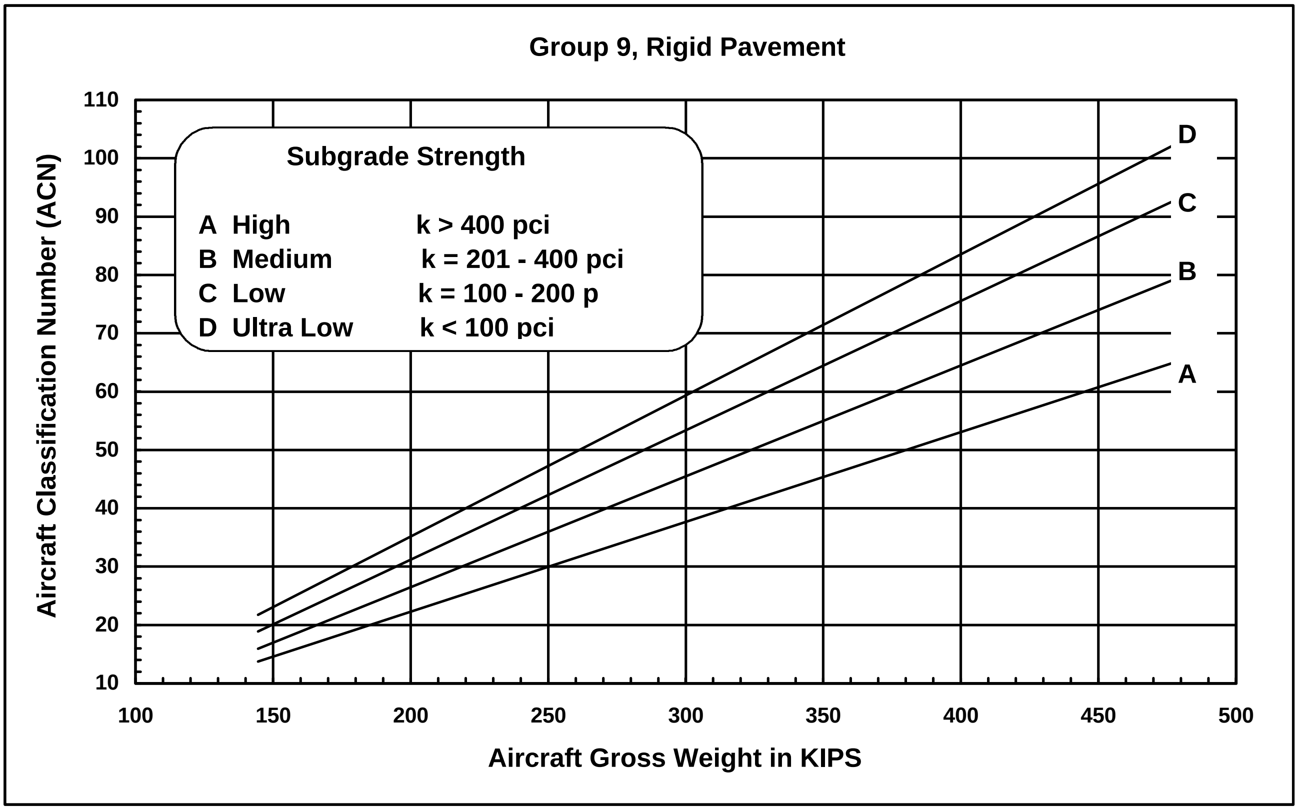

Group 6, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
D
C
B
A
Aircraft Classification Numbers (ACN)
50
45
40
35
30
25
20
15
10
50
75
100
125
150
175
Aircraft Gross Weight in KIPS

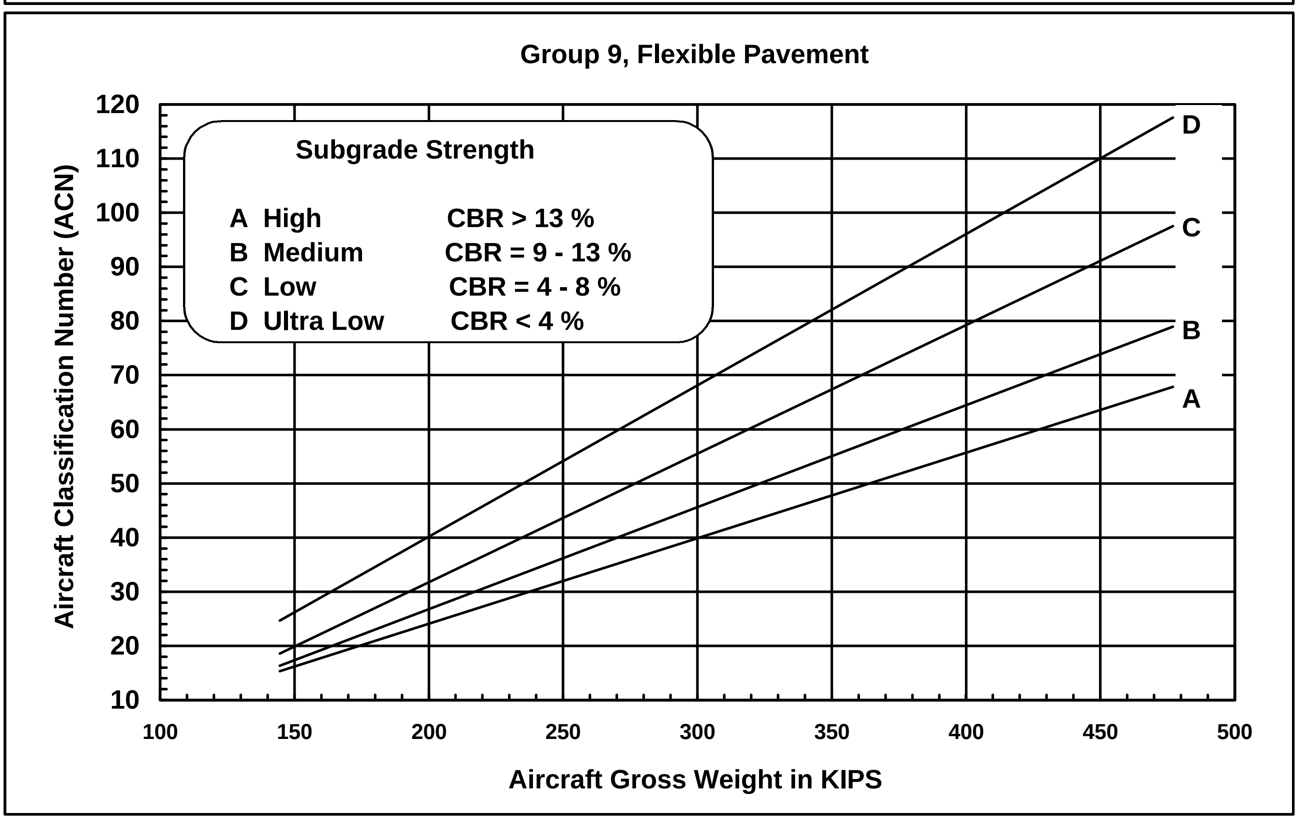

Group 7, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
70
60
50
40
30
20
75
100
125
150
175
200
225
D
C
B
A

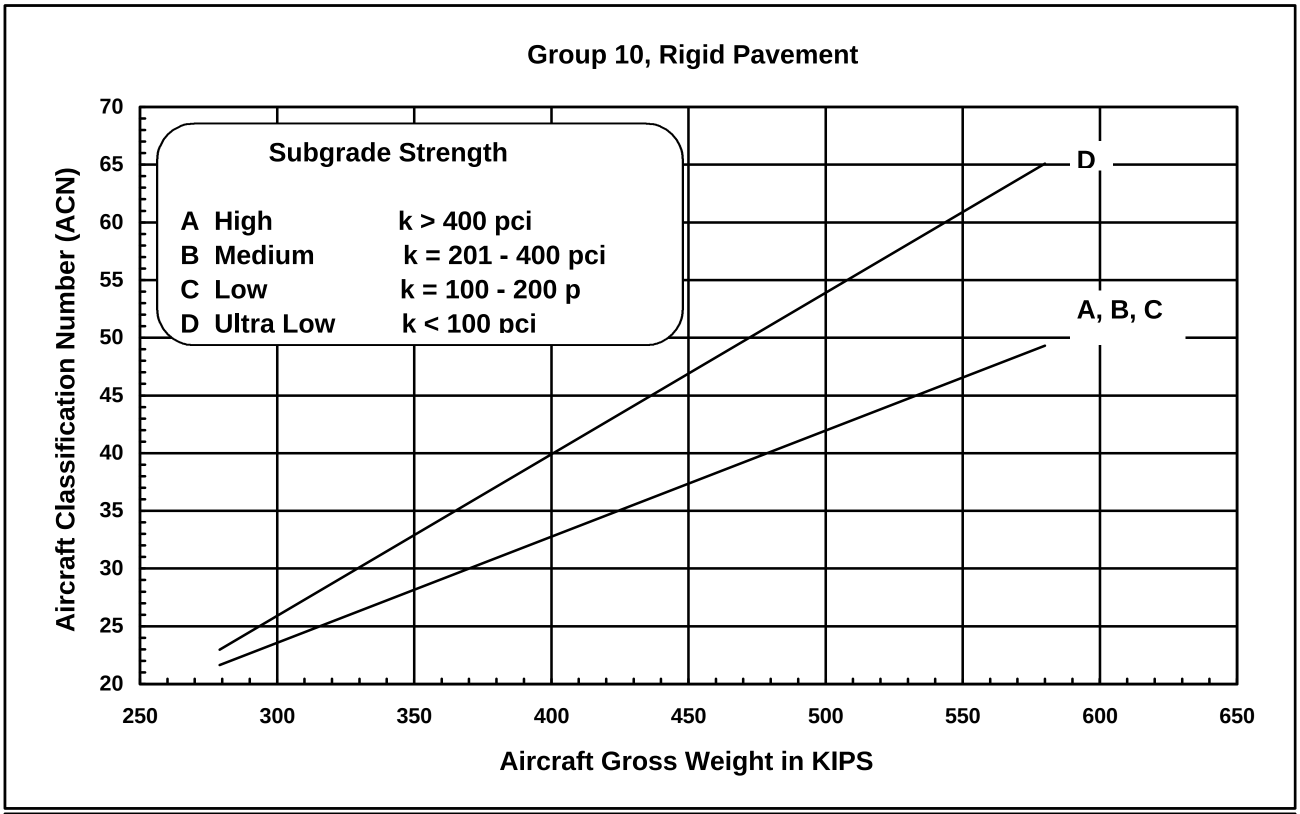

Group 7, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
70
60
50
40
30
20
10
75
100
125
150
175
200
225
D
C
B
A

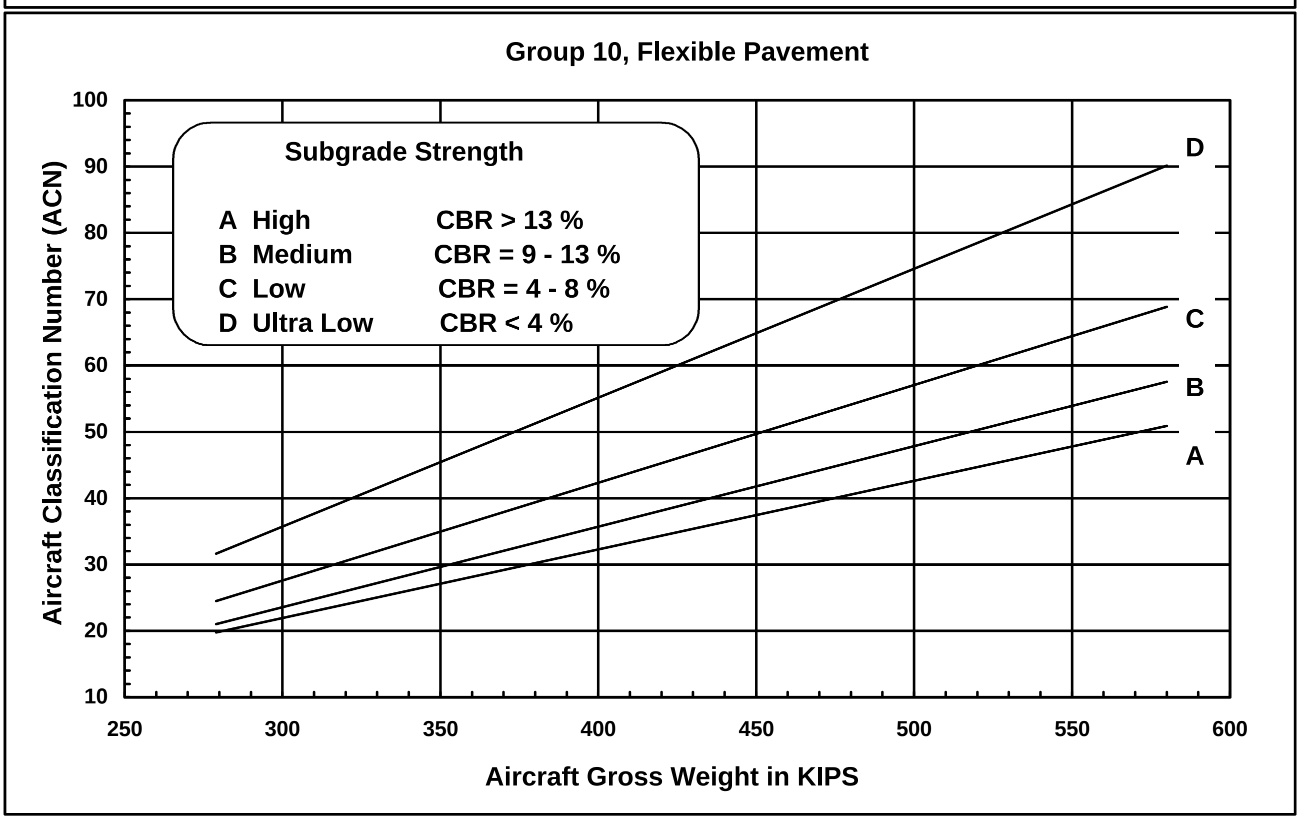

Group 8, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
10
20
30
40
50
60
70
80
90
125
150
175
200
225
250
275
300
325
350
375
400

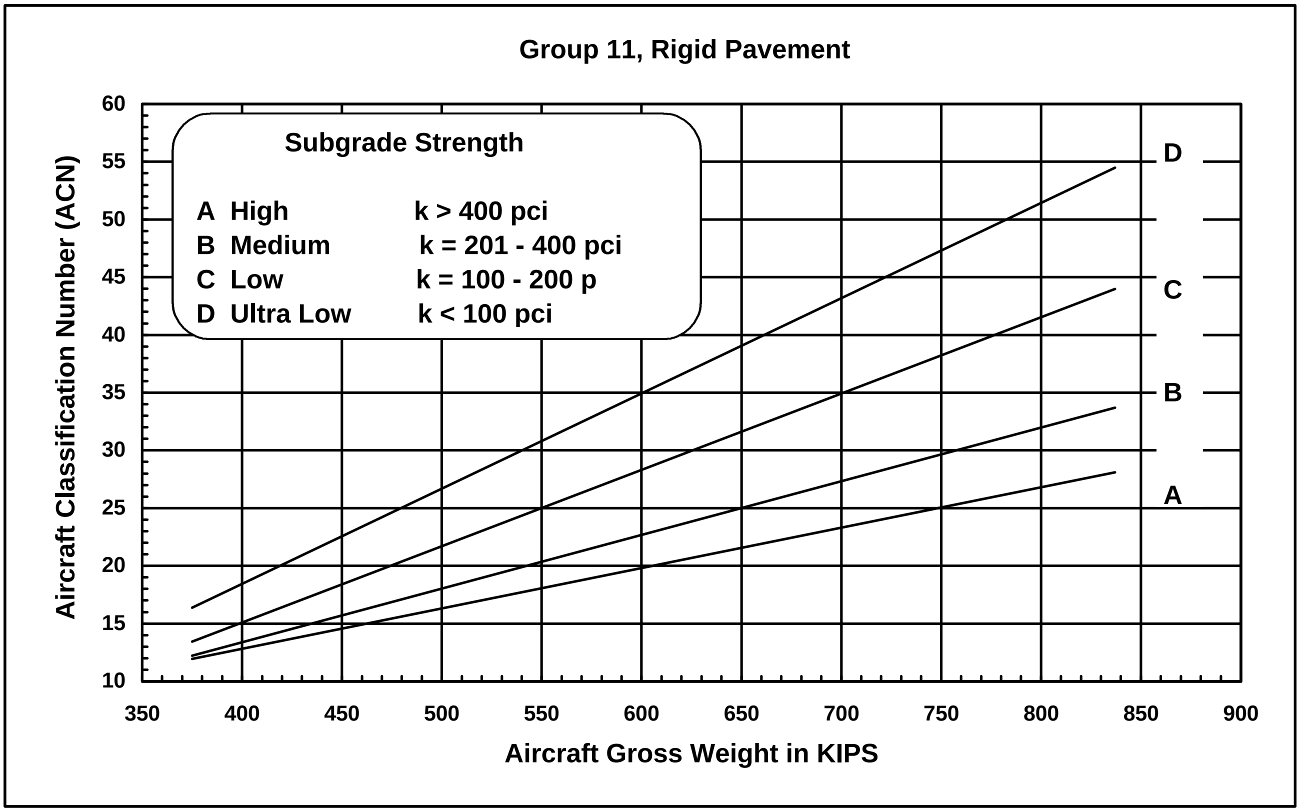

Group 8, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
10
20
30
40
50
60
70
80
90
125
150
175
200
225
250
275
300
325
350
375
400

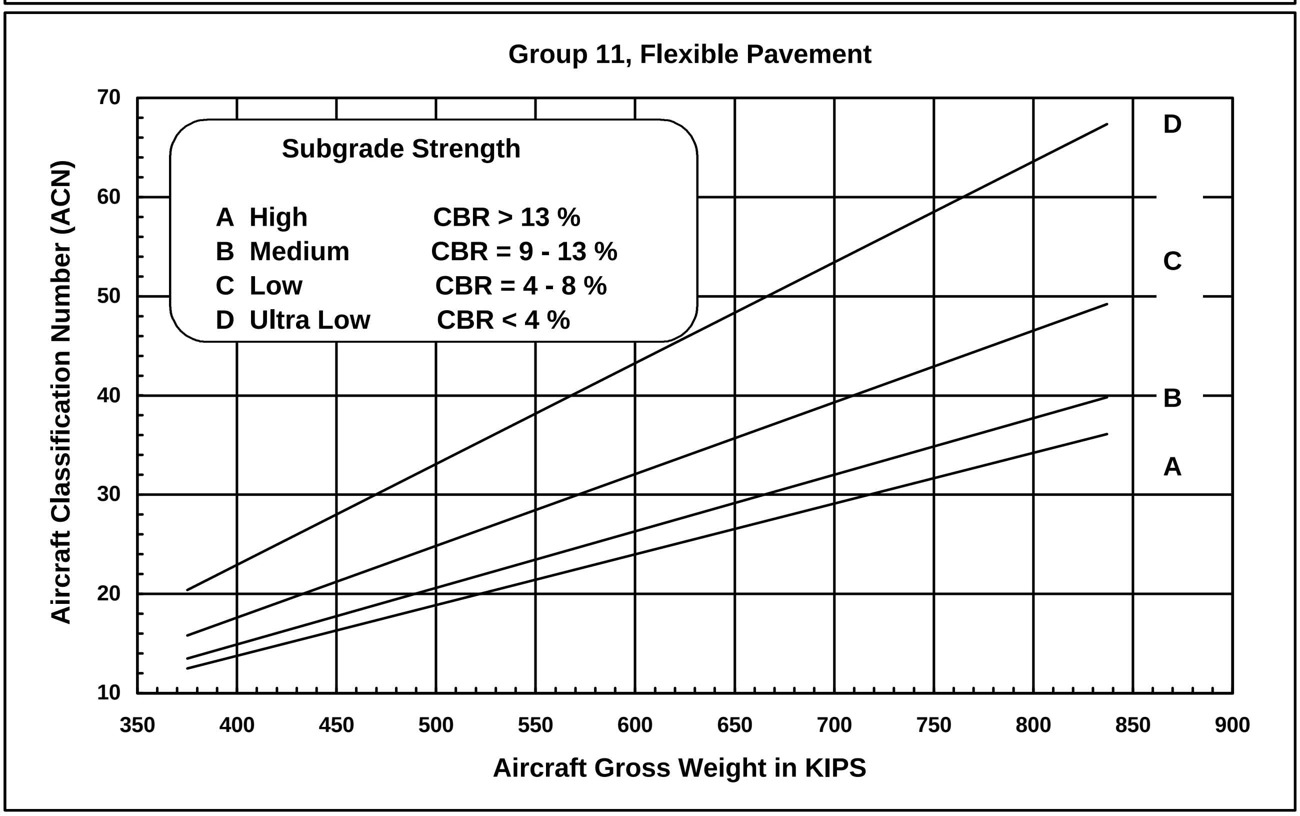

Group 9, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
110
100
90
80
70
60
50
40
30
20
10
100
150
200
250
300
350
400
450
500
A
B
C
D

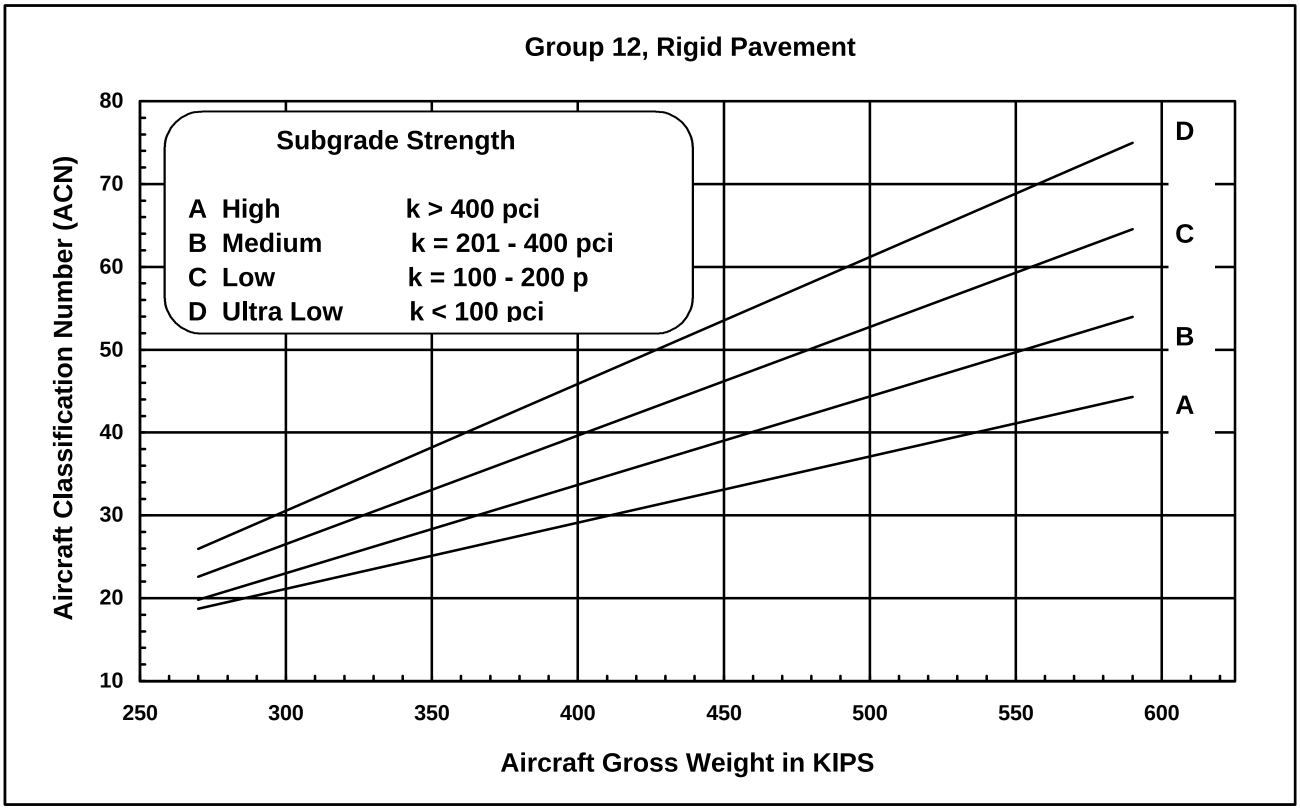

Group 9, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
120
110
100
90
80
70
60
50
40
30
20
10
100
150
200
250
300
350
400
450
500
A
B
C
D

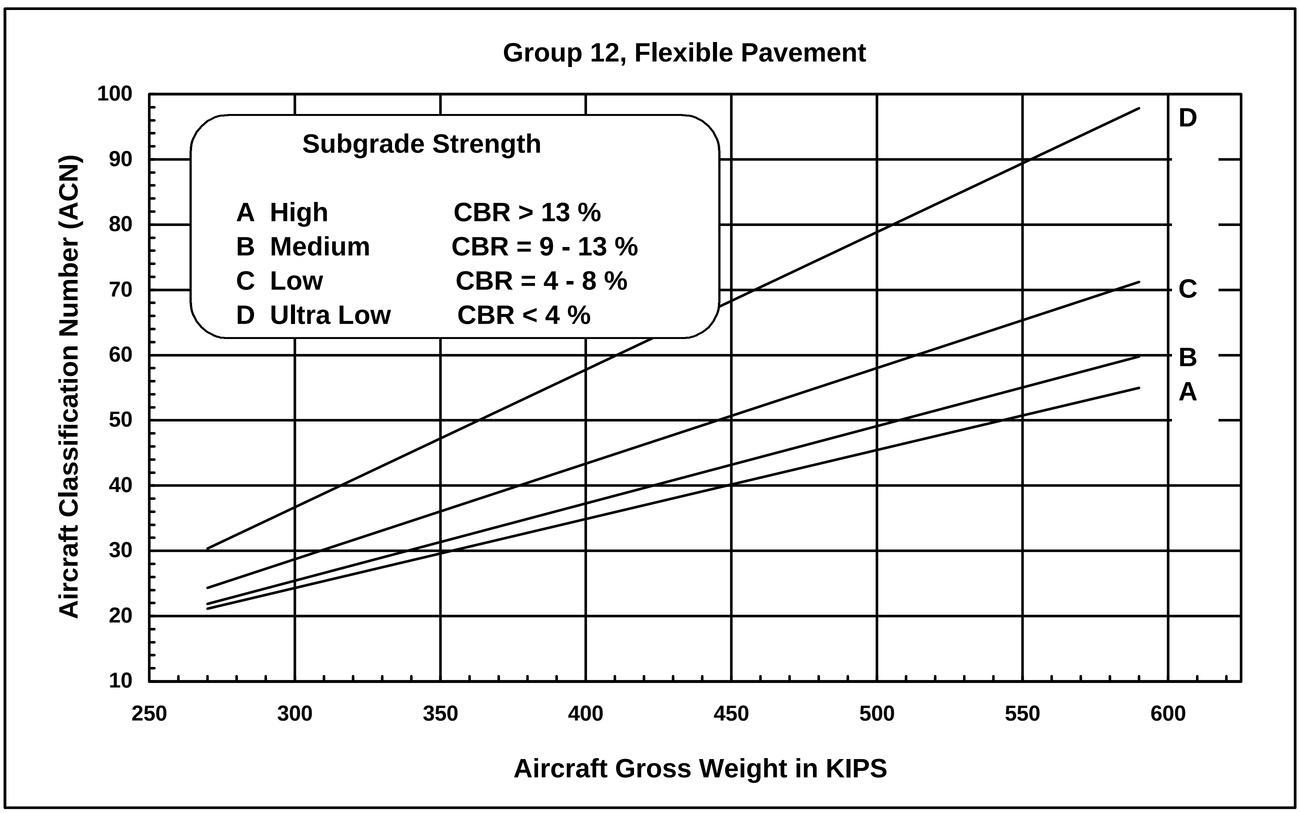

Group 10, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
D
A, B, C
Aircraft Classification Number (ACN)
70
65
60
55
50
45
40
35
30
25
20
250
300
350
400
450
500
550
600
650
Aircraft Gross Weight in KIPS

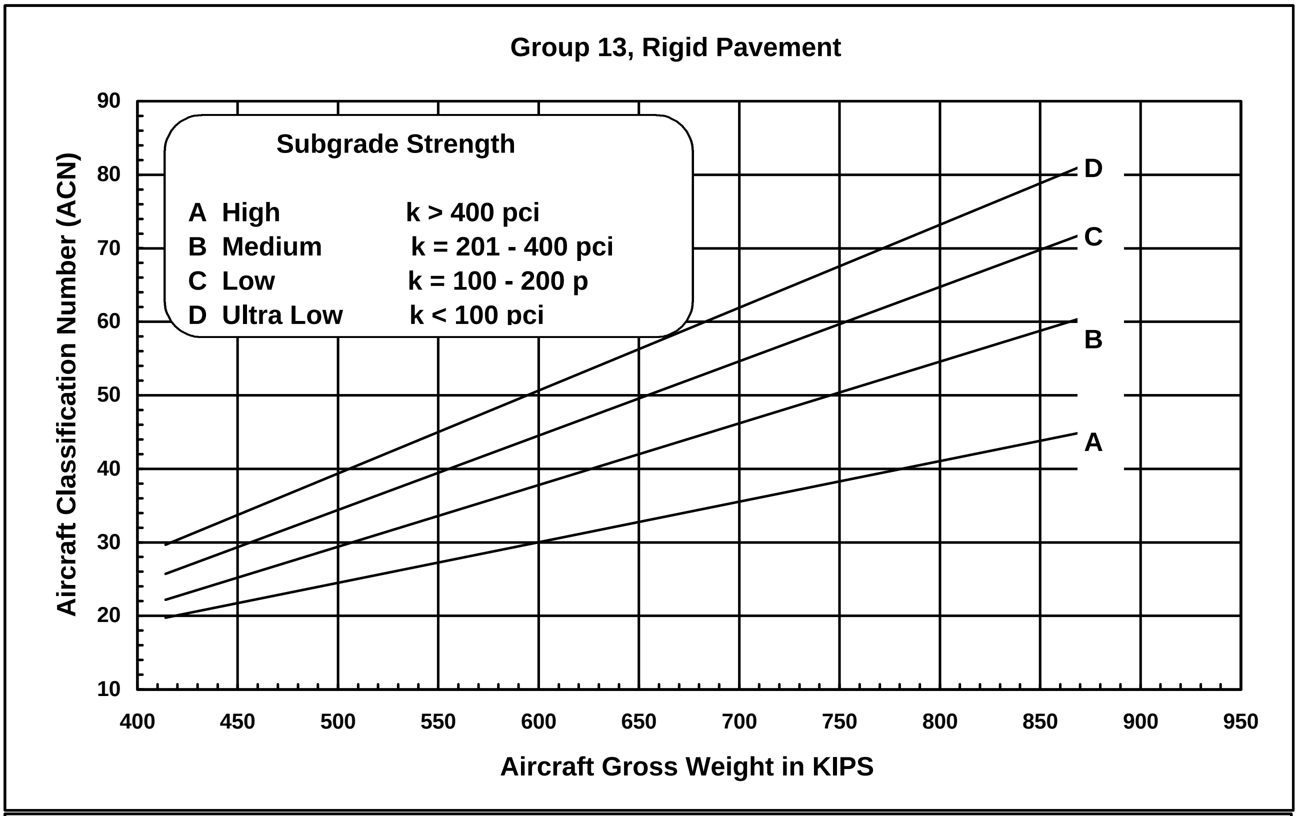

Group 10, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
D
C
B
A
Aircraft Classification Number (ACN)
100
90
80
70
60
50
40
30
20
10
250
300
350
400
450
500
550
600
Aircraft Gross Weight in KIPS

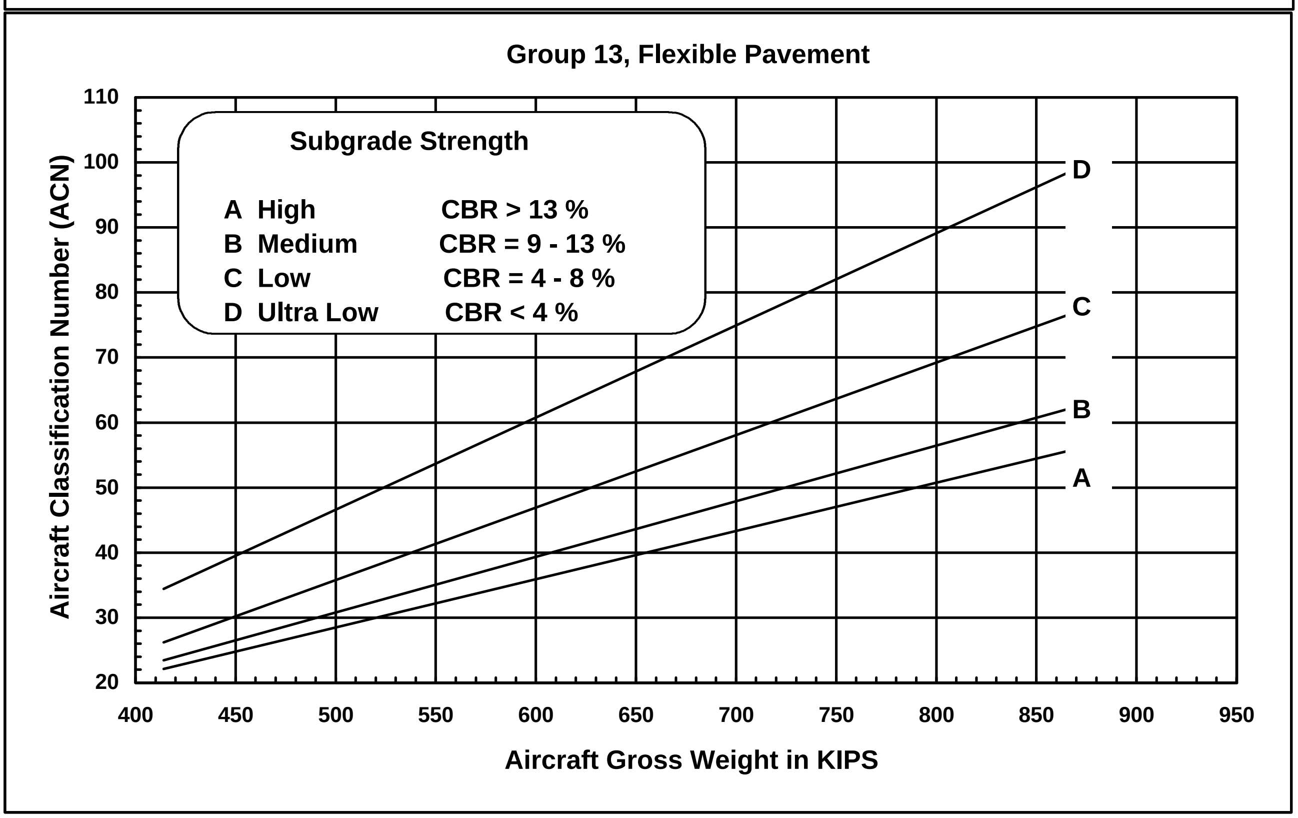

Group 11, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
60
55
50
45
40
35
30
25
20
15
10
350
400
450
500
550
600
650
700
750
800
850
900
D
C
B
A

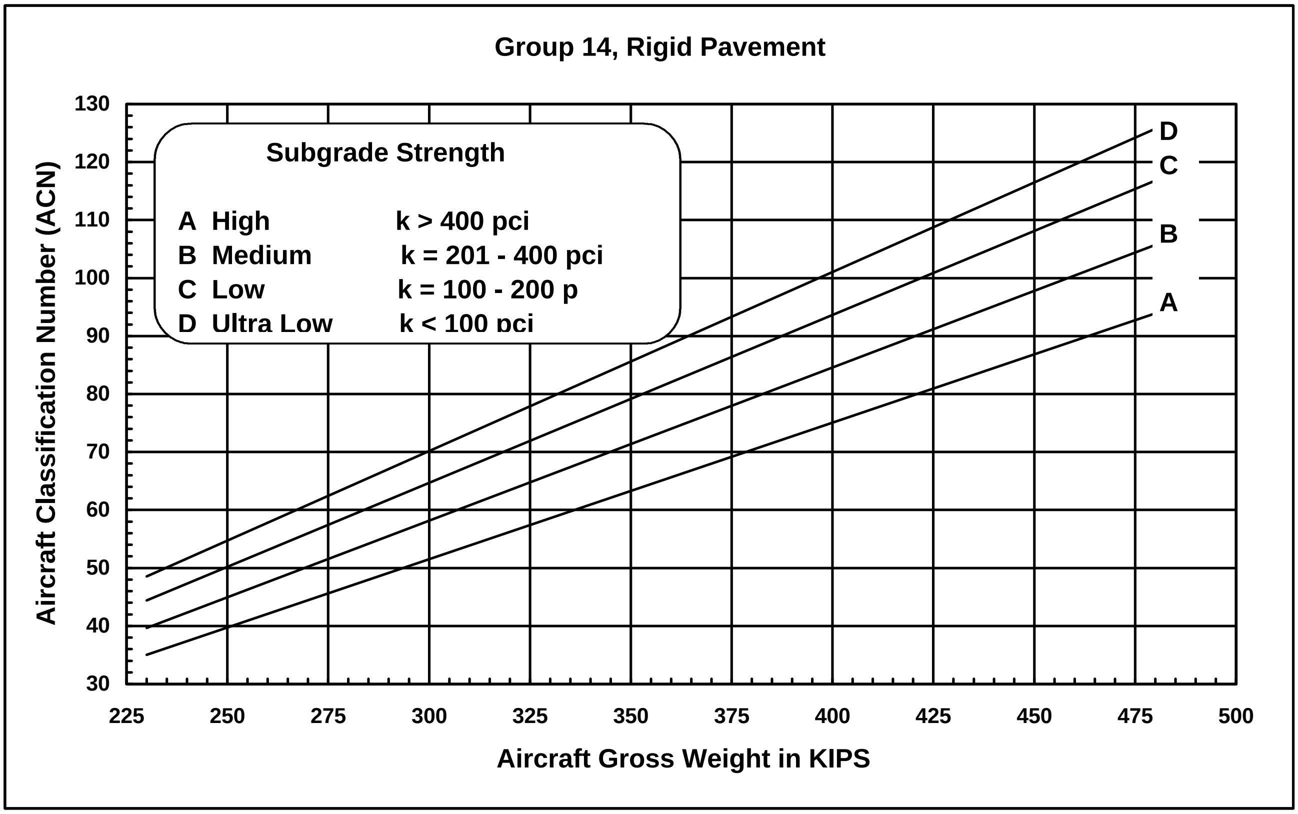

Group 11, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
70
60
50
40
30
20
10
350
400
450
500
550
600
650
700
750
800
850
900
D
C
B
A


Group 12, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
80
70
60
50
40
30
20
10
250
300
350
400
450
500
550
600
D
C
B
A

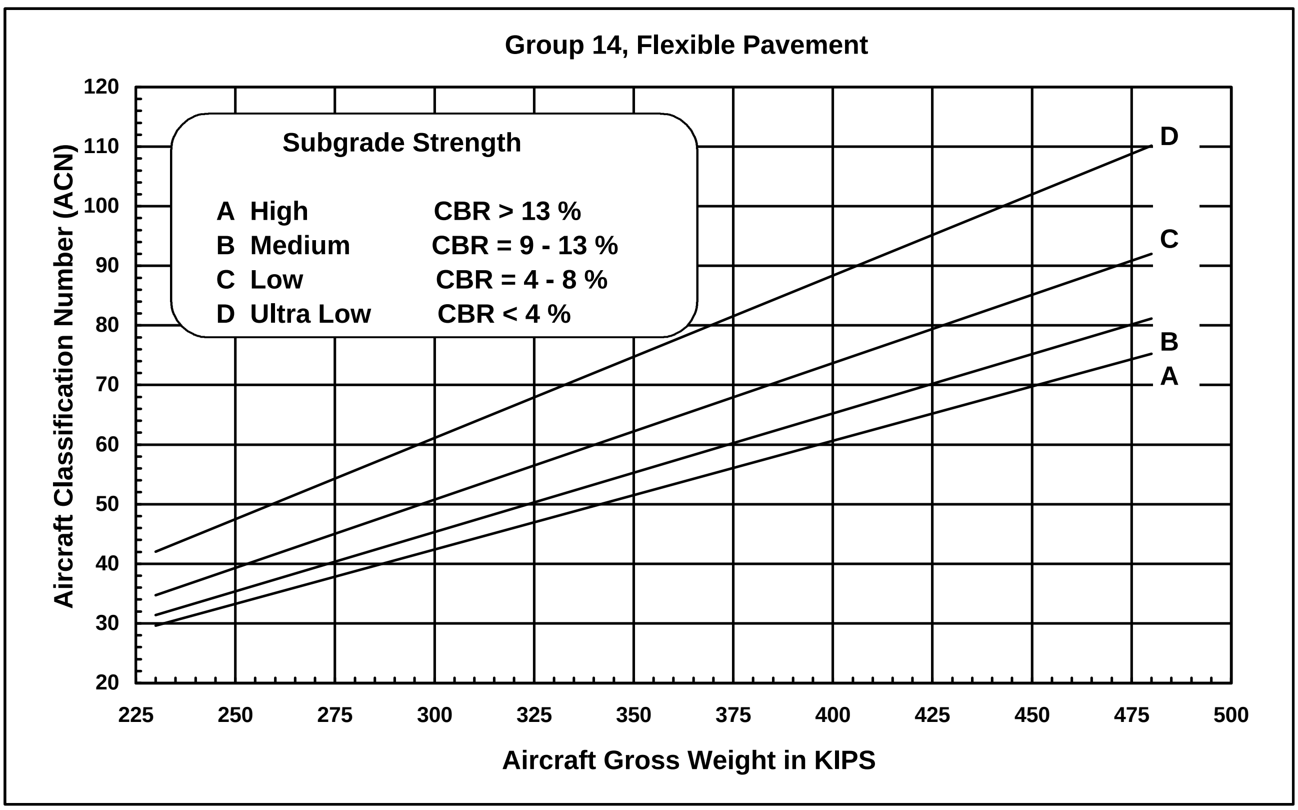

Group 12, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
100
90
80
70
60
50
40
30
20
10
250
300
350
400
450
500
550
600
D
C
B
A


Group 13, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
90
80
70
60
50
40
30
20
10
400
450
500
550
600
650
700
750
800
850
900
950
A
B
C
D

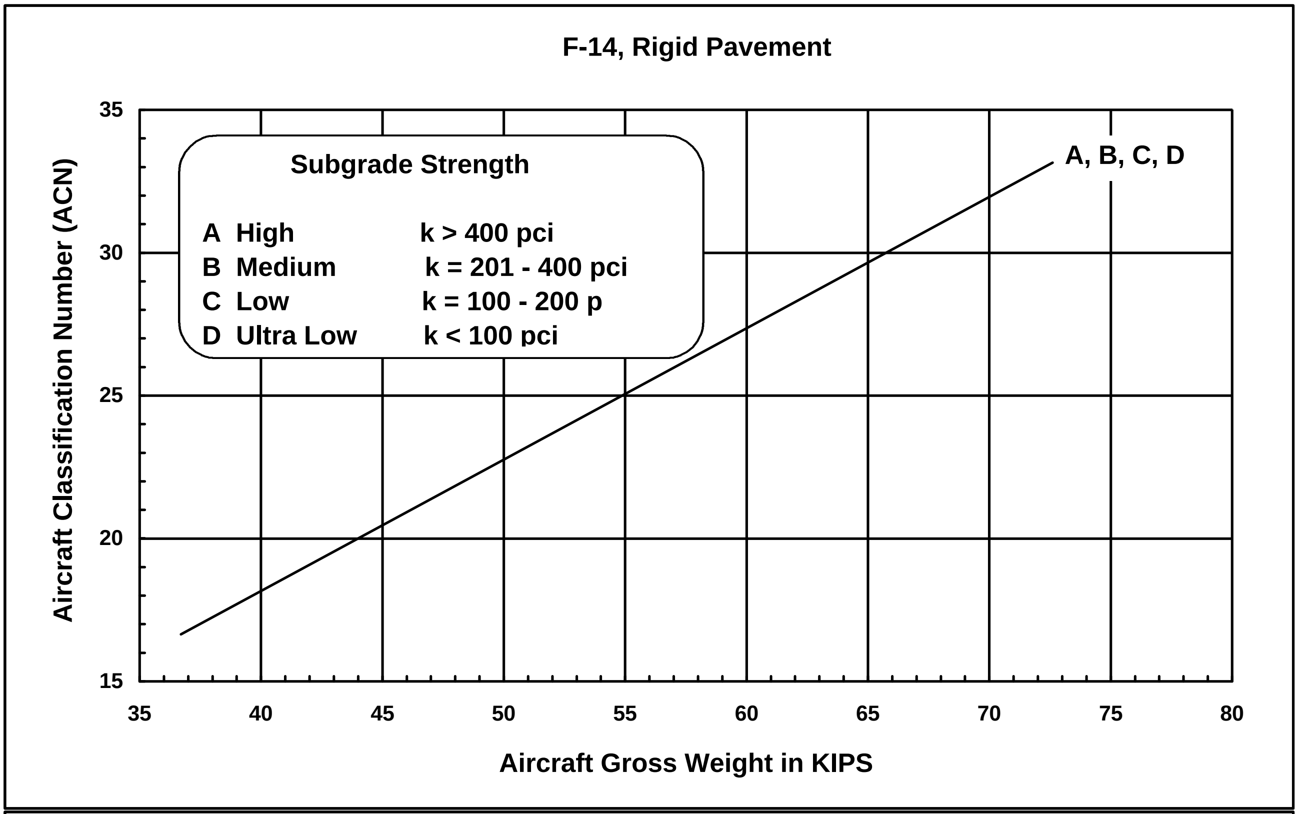

Group 13, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
110
100
90
80
70
60
50
40
30
20
400
450
500
550
600
650
700
750
800
850
900
950
A
B
C
D

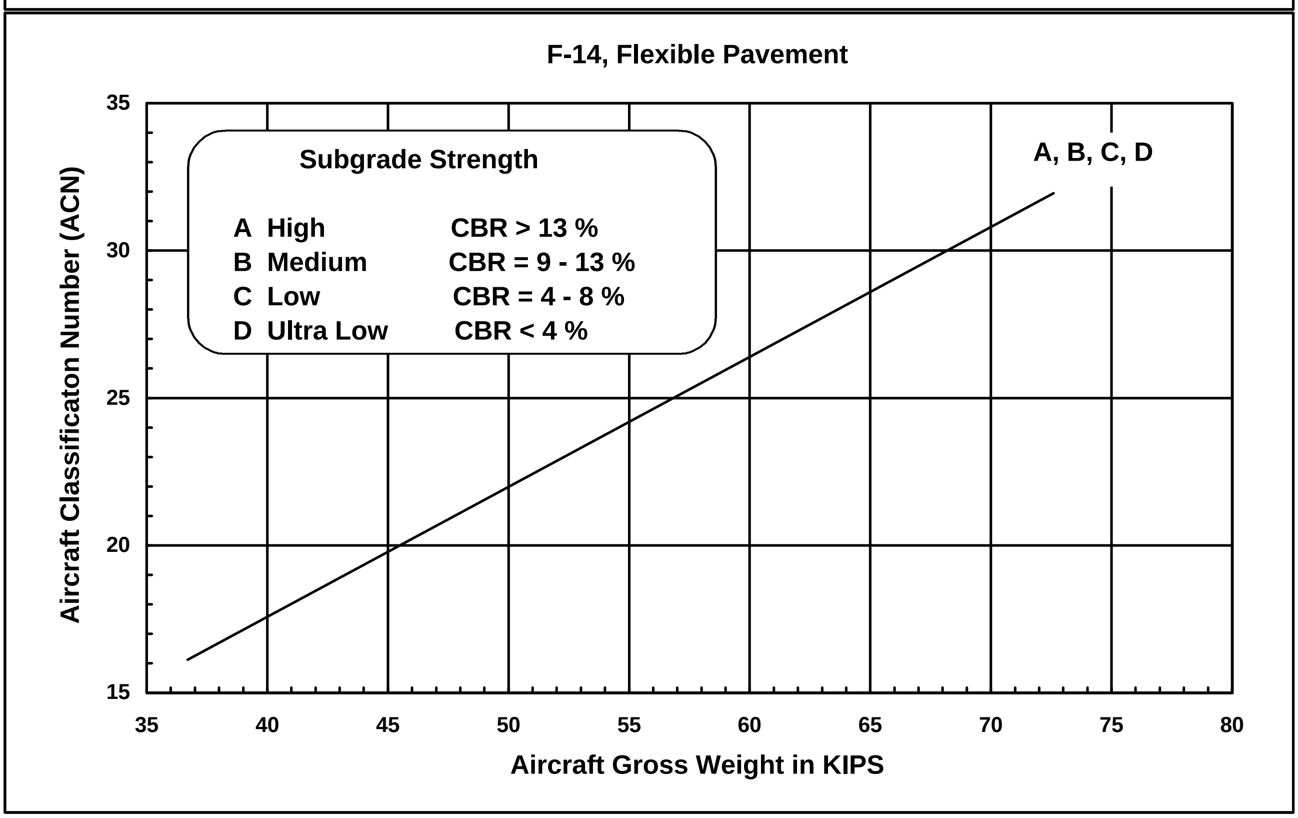


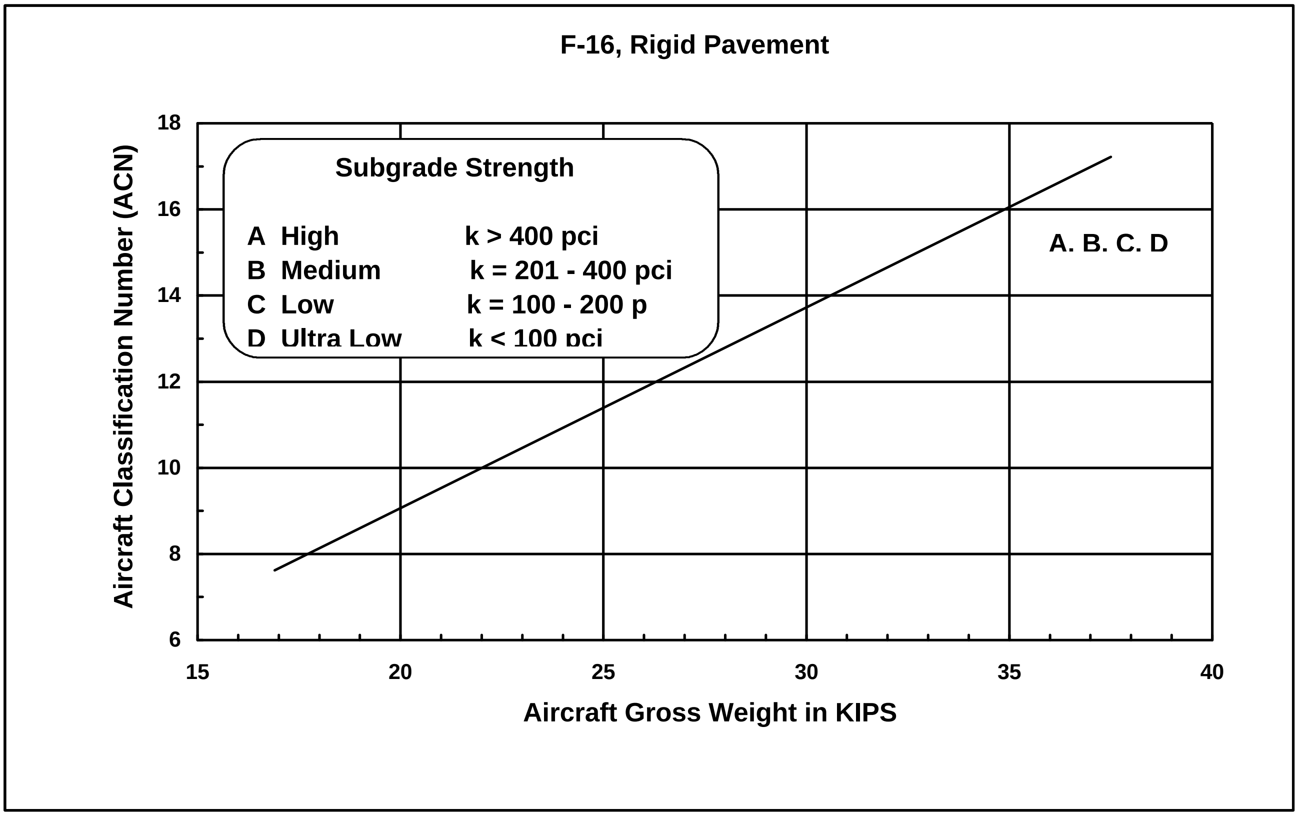
Group 14, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
130
120
110
100
90
80
70
60
50
40
30
225
250
275
300
325
350
375
400
425
450
475
500
D
C
B
A

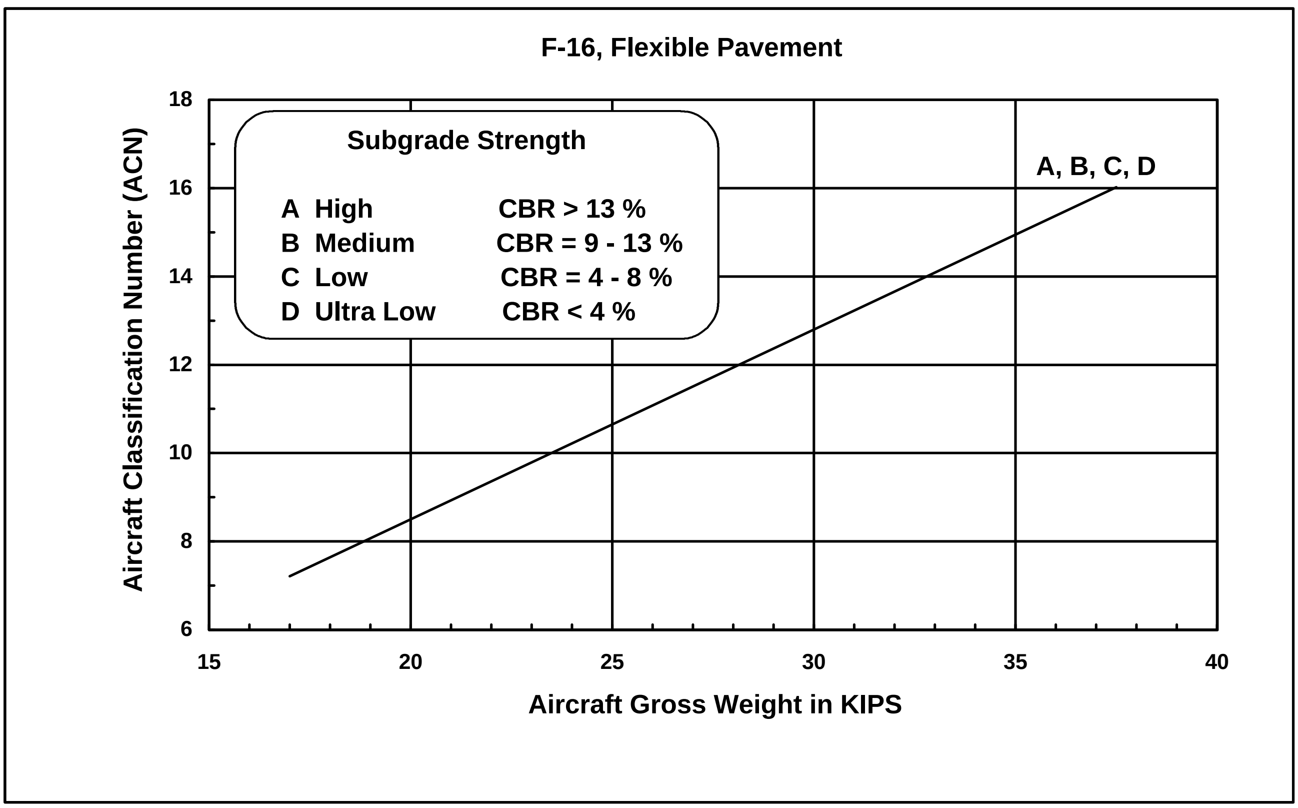


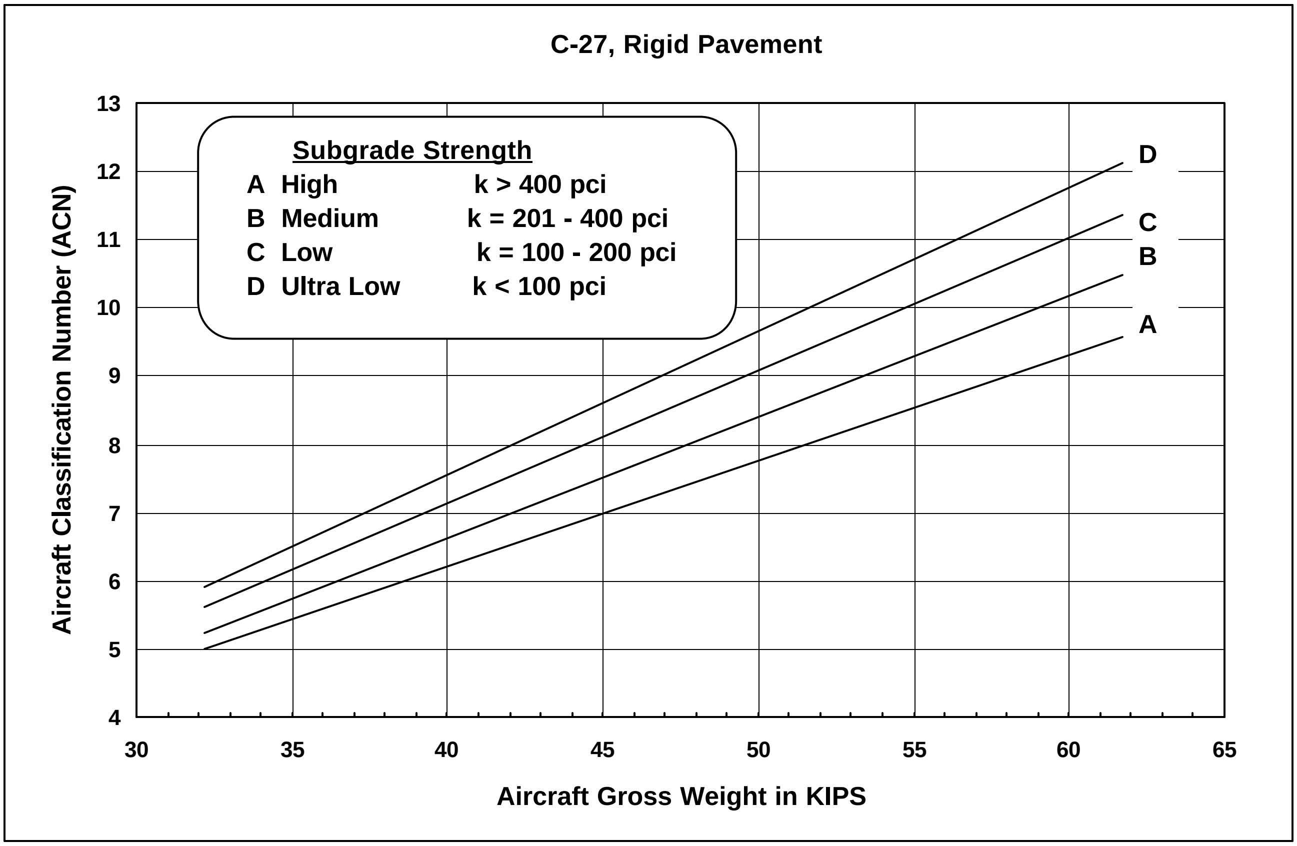
Group 14, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
120
110
100
90
80
70
60
50
40
30
20
225
250
275
300
325
350
375
400
425
450
475
500
D
C
B
A

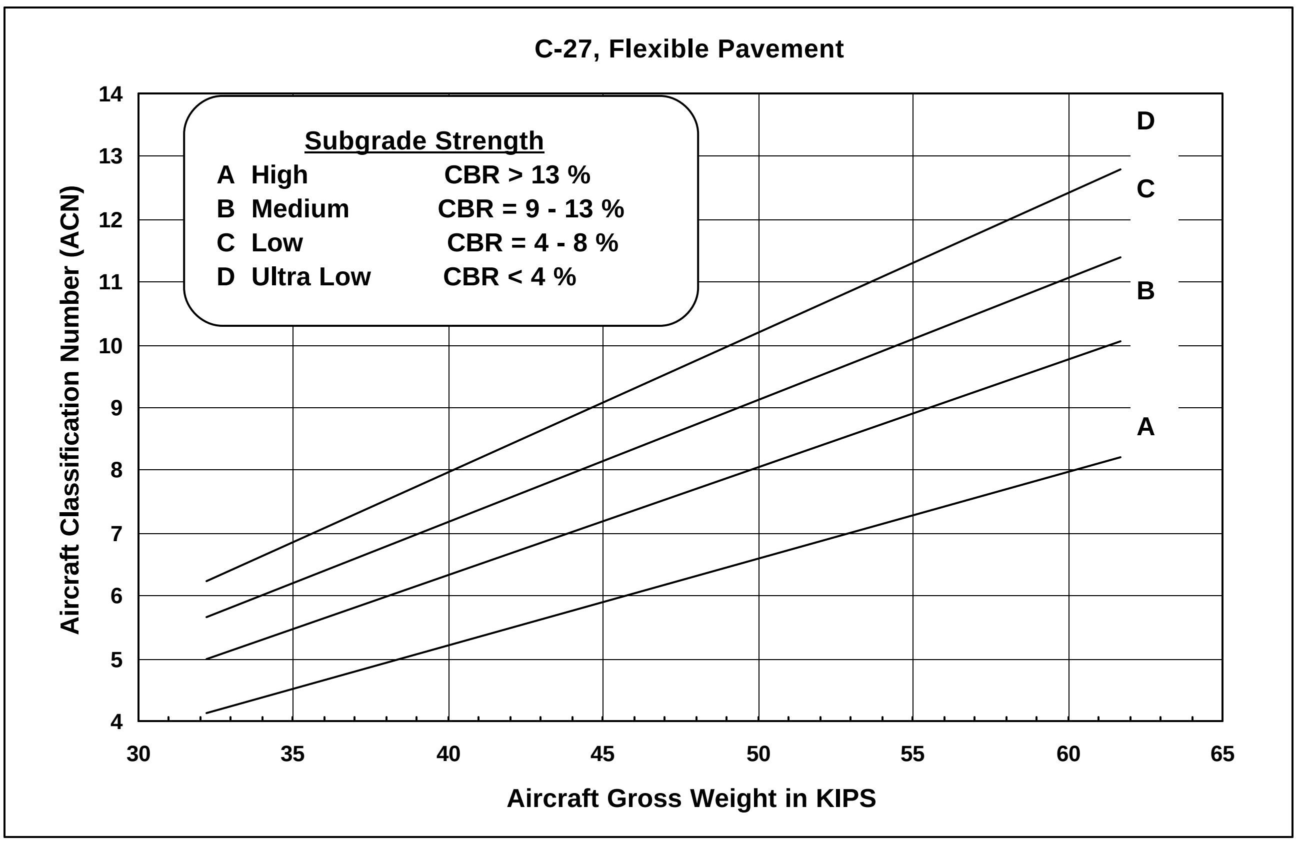

F-14, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
A, B, C, D
Aircraft Classification Number (ACN)
35
30
25
20
15
35
40
45
50
55
60
65
70
75
80
Aircraft Gross Weight in KIPS


F-14, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
A, B, C, D
Aircraft Classificaton Number (ACN)
35
30
25
20
15
35
40
45
50
55
60
65
70
75
80
Aircraft Gross Weight in KIPS


F-16, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 p
D Ultra Low k < 100 pci
A. B. C. D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
18
16
14
12
10
8
6
15
20
25
30
35
40


F-16, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
A, B, C, D
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
18
16
14
12
10
8
6
15
20
25
30
35
40


C-27, Rigid Pavement
Subgrade Strength
A High k > 400 pci
B Medium k = 201 - 400 pci
C Low k = 100 - 200 pci
D Ultra Low k < 100 pci
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
4
5
6
7
8
9
10
11
12
13
30
35
40
45
50
55
60
65


C-27, Flexible Pavement
Subgrade Strength
A High CBR > 13 %
B Medium CBR = 9 - 13 %
C Low CBR = 4 - 8 %
D Ultra Low CBR < 4 %
Aircraft Classification Number (ACN)
Aircraft Gross Weight in KIPS
A
B
C
D
4
5
6
7
8
9
10
11
12
13
14
30
35
40
45
50
55
60
65

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AIRCRAFT GROUP INDEX

LIGHT LOAD			MEDIUM LOAD								HEAVY LOAD		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
A-37	A-7	F-111*	C-130*	C-7	B-737	B-727*	B-707	C-141*	C-17*	C-5*	KC-10*	B-747	B-52*
C-12	A-10	FB-111		C-9*	T-43*	C-22	E-3*	B-1*			DC-10	E-4*	
C-21	F-4			DC-9			C-135	B-757			L-1011	VC-25	
C-23*	F-5			C-140			KC-135*						
T-37	F-15*						VC-137						
T-1A	F-16						DC-8						
	F-10X						EC-18						
	T-33						A-300						
	T-38						B-767						
	T-39												
	OV-10												
	C-20												

*** INDICATES CONTROLLING AIRCRAFT FOR THE GROUP**

AIRCRAFT GROUP GROSS WEIGHT LIMITS IN KIPS

AIRCRAFT GROUP INDEX	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOWEST POSSIBLE GROSS WEIGHT	5.0	7.0	53.7	69.0	19.6	60.5	96.0	135.6	144.5	279.0	375.0	270.0	414.1	230.0
HIGHEST POSSIBLE GROSS WEIGHT	26.0	81.0	100.0	175.0	122.0	150.0	210.0	380.0	477.0	580.0	837.0	590.0	870.0	480.0

PASS INTENSITY LEVELS

LEVEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I	300,000 PASSES			50,000 PASSES								15,000 PASSES		
II	50,000 PASSES			15,000 PASSES								3,000 PASSES		
III	15,000 PASSES			3,000 PASSES								500 PASSES		
IV	3,000 PASSES			500 PASSES								100 PASSES		

IN REFERENCE TO THE ALLOWABLE GROSS LOAD (AGL) TABLES:

A - Denotes lowest possible empty gross weight of any aircraft within the group exceeds the AGL of the pavement. The pavement cannot support the aircraft for the respective pass intensity level.

+ - Denotes no weight restrictions. The AGL capability of the pavement exceeds the greatest possible gross weight of any aircraft in the group.

UNITED STATES AIR FORCE
CIVIL ENGINEER SUPPORT AGENCY
TYNDALL AFB, FLORIDA

RELATED DATA

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