UNIT 8 – AERODROMES

PAVEMENT CLASSIFICATION NUMBER (PCN)

Pavement Classification Number (PCN) is a number that expresses the load-carrying capacity of a pavement for unrestricted operations.[1] The PCN is a standard used in conjunction with the Aircraft Classification Number (ACN)[2] in order to indicate the load bearing strength of a movement area of an airport. This is primarily to ensure that the life of the surface is prolonged whereby not subject to excessive loads or wear. Resurfacing of these areas are very costly in terms of time and money. In order to determine the PCN, the highest ACN calculated on a regular basis is used as a datum. The PCN values are published in the Aerodrome section of a country's AIP[3] as well as distributed via NOTAM[4] on temporary or permanent basis.

The PCN number is a numerical index that is obtained using complex calculations as stipulated by ICAO. This number gives a reference for the load carrying capacity of the pavement.

The ACN must always be less than the PCN in order to safely operate. Typical ACN values for different types of aircraft are: Gulfstream 450 (ACN=27), A320 (ACN=42). An estimation of the ACN can be obtained by the single wheel load, inflated at 1.25 MPa, known as the Derived Single Wheel Load (DSWL). The ACN is essentially 2 X DSWL expressed in thousands of Kg. Once the ACN is determined, it must be compared with the PCN.

Below is an example of how to decode a PCN:

PCN Decode Table		
Example : **PCN 89/F/C/W/T**		
Identifier	**Name**	**Description**
89	PCN numerical value	Indicates load carrying capacity of the pavement. Based primarily on the aircraft type and type of traffic patterns.
F	Rigid (R) or Flexible (F)	**R** - Rigid (concrete) **F** - Flexible (asphalt)
C	Subgrade Category[5]	**A** - High Strength – CBR[6] 15 (CBR > 13%). *Subgrade (k) > 120 MN/m³* **B** - Medium Strength – CBR 10 (CBR between 8% to 13%). *k =60-120 Mn/m³* **C** - Low Strength – CBR 6 (CBR between 4% to 8%). *k = 25-60 MN/m³* **D** - Ultra-Low Strength – CBR 3 (For CBR < 4%). *k = < 25 MN/m³*
W	Maximum supported tyre pressure on pavement.	**W** - (unlimited) - no tyre pressure limit. **X** - (high) - maximum tyre pressure of 1.75 MPa. **Y** - (medium) - maximum tyre pressure of 1.25 MPa. **Z** - (low) - maximum tyre pressure of 0.5 MPa.
T	Evaluation method	**T** – Technical evaluation **U** – Physical testing (usage)

Table 1 - PCN Decode table

[1] Source: FAA AC 150/5335-5

[2] ACN is obtained from the aircraft flight manual and performance charts and is used in conjunction with the PCN to determine a safe operating limit.

[3] AIP – Aeronautical Information Publication.

[4] NOTAM – Notice to Airmen.

[5] Subgrade category refers to the strength of the underlying layer (below the pavement). A grade of "A" would be concrete and clay (strong) and a grade of "D" would be uncompacted soil (weak).

[6] **CBR** (California Bearing Ratio) is the ratio (expressed as a percentage) of a load that penetrates a particular substrate to a specified depth compared to the depth achieved with the same load on crushed stone. This is used to determine the substrate of a layer before paving.

Therefore, the code PCN 89/F/C/W/T is interpreted as a flexible pavement classification of 89 on a low strength subgrade that can withstand unlimited tyre pressure determined by technical evaluation. In this example, we have used Amsterdam Schiphol airport. Note that Amsterdam lies on low wetland (hence the low strength of the substrate) but can support all types of aircraft due to the construction of the pavement and strengthened substrates.