



# **FLEXIBLE PAVEMENT DESIGN CONSIDERATIONS**

**PAVEMENT DESIGN – A LOOK AT WHAT LIES UNDERNEATH**

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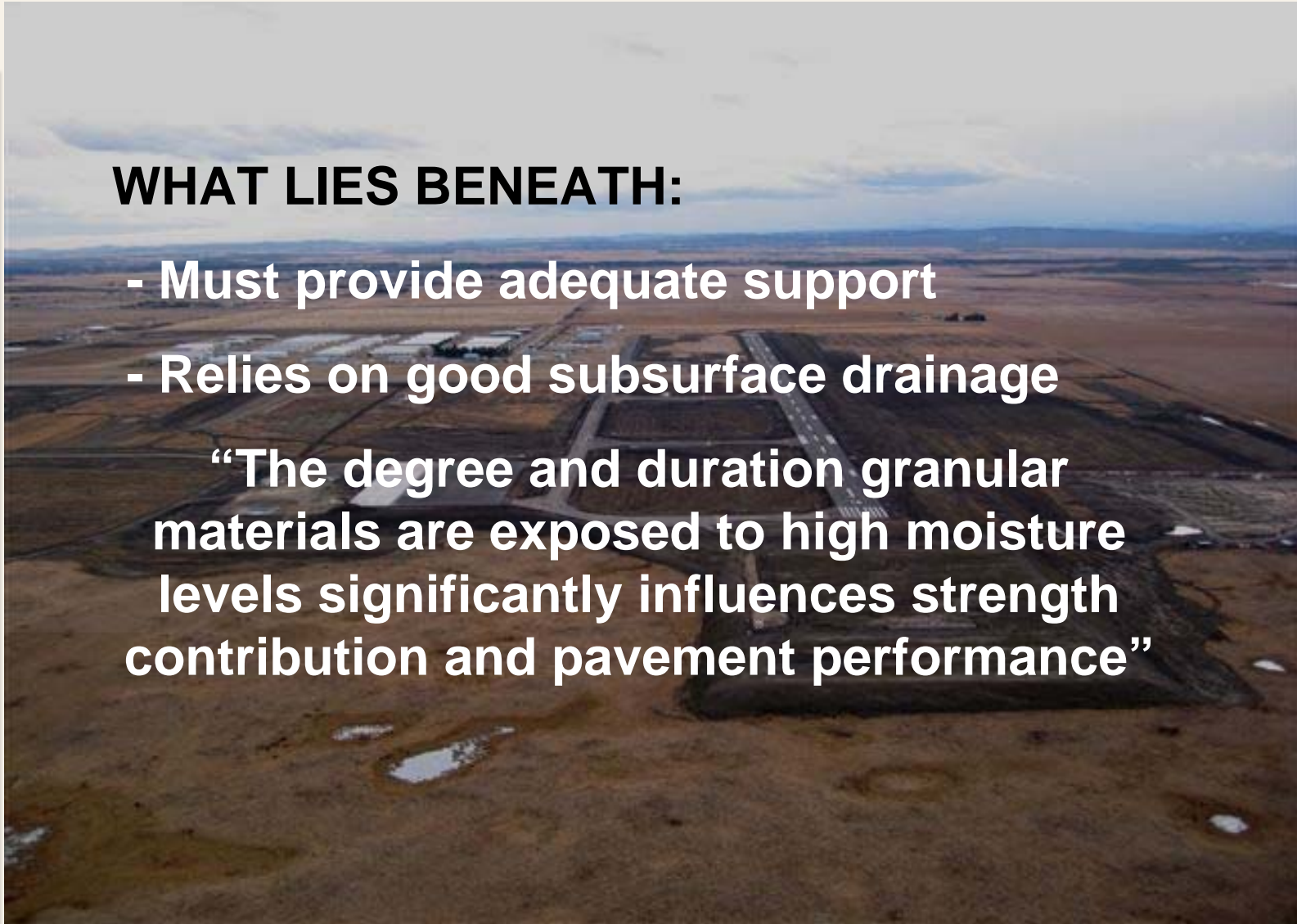
**EBA Engineering Consultants Ltd.**

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## **WHAT LIES BENEATH:**

- Must provide adequate support
- Relies on good subsurface drainage

**“The degree and duration granular materials are exposed to high moisture levels significantly influences strength contribution and pavement performance”**



A photograph of a long, straight asphalt runway or taxiway stretching into the distance. The pavement is dark grey and shows several prominent, irregular cracks running across it. The horizon is flat with some greenery and a small structure visible in the distance under a grey, overcast sky.

**DO WE NEED TO PROVIDE ADEQUATE  
SUBSURFACE DRAINAGE?**

**BUT IN ADDITION, SHOULD WE NOT  
DESIGN TO SIGNIFICANTLY REDUCE  
THE POTENTIAL FOR MOISTURE  
INFILTRATION?**



**FROST BOILS**

## DIFFERENTIAL MOVEMENT



## LOW-TEMPERATURE INDUCED CRACKING



A photograph of a wide, flat asphalt road with extensive, irregular cracking. The road is surrounded by a grassy field and a rocky hill in the background under a cloudy sky.

**“...at Canadian airports, low temperature cracking is considered the most significant problem while rutting and high temperature performance issues are less significant.”**

**Scarlett & McMillan, CTAA 1997**

## ASPHALT BINDER SELECTION

Previous methods (PWGSC) based on Site Freezing Index and Airfield Application

Now we have the ability to design and specify “crack-free” flexible pavements (in much of Canada)

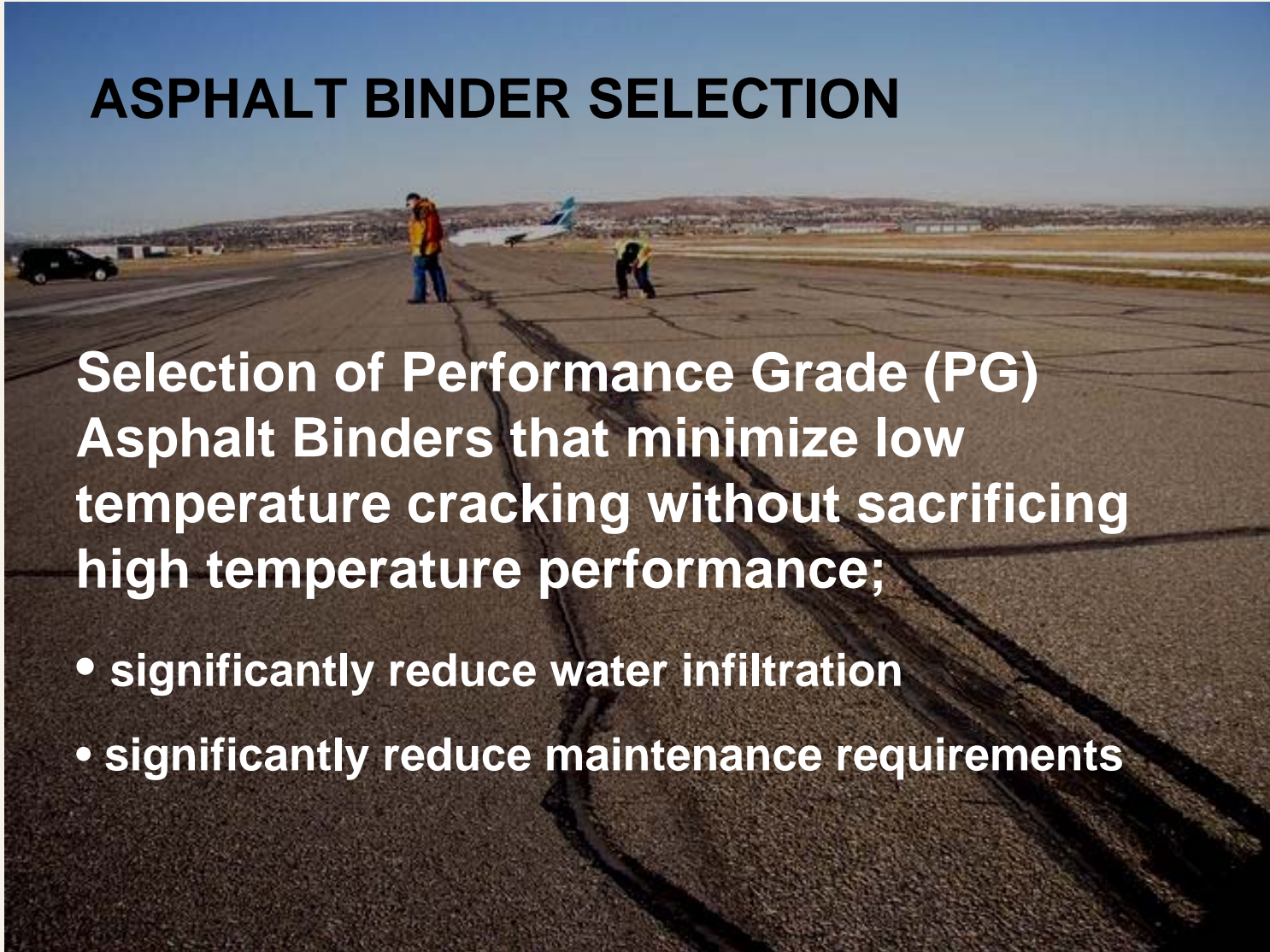




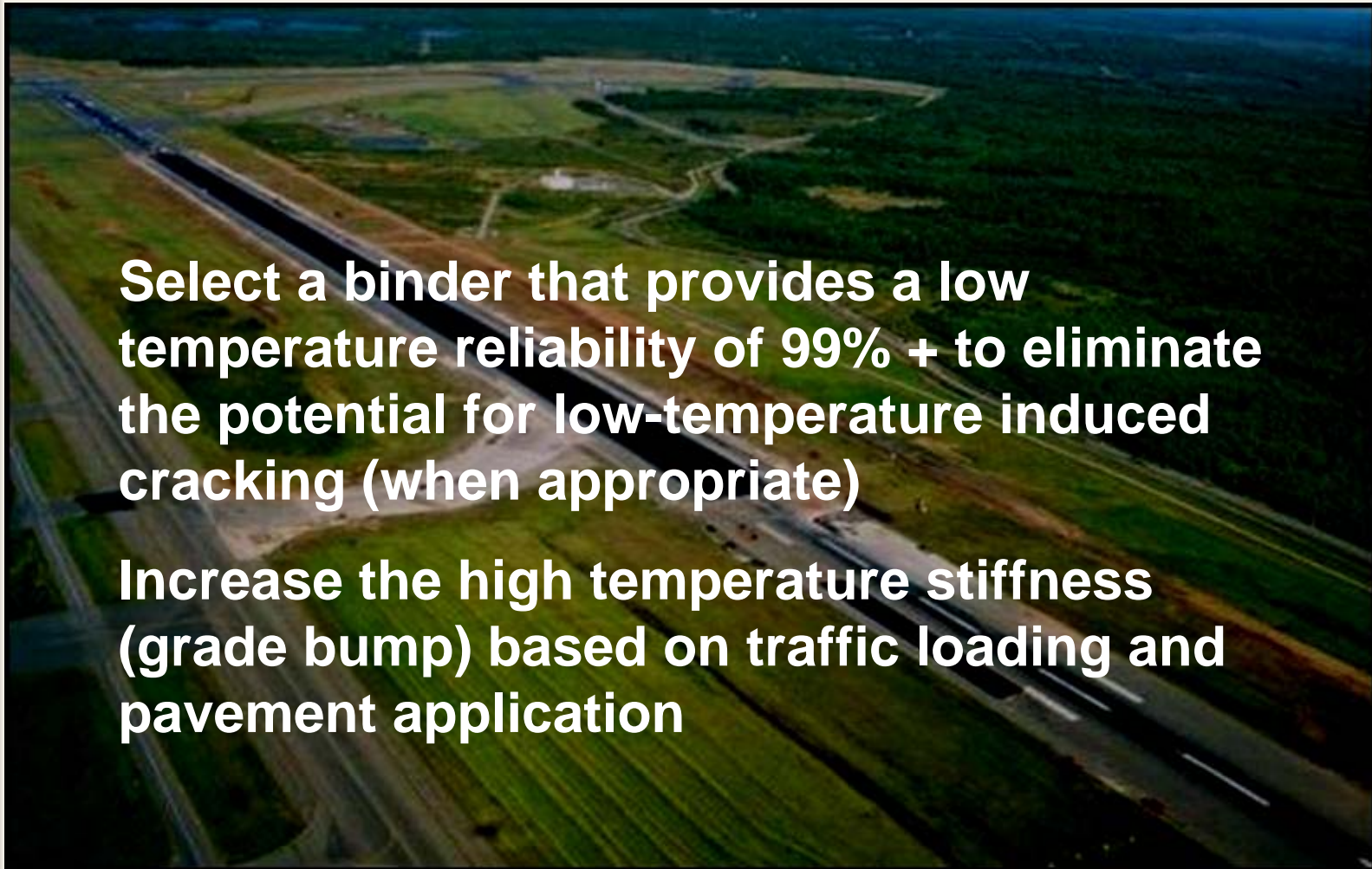
## ASPHALT BINDER SELECTION

**Selection of Performance Grade (PG) Asphalt Binders that minimize low temperature cracking without sacrificing high temperature performance;**

- **significantly reduce water infiltration**
- **significantly reduce maintenance requirements**



## ASPHALT BINDER SELECTION



## **ASPHALT BINDER SELECTION IS BASED ON:**



**Climate**

**Aircraft Loading**

**Traffic Condition**

**Application (New  
or Rehabilitation)**

**Position in  
Pavement**

## **AND IS CONTROLLED BY:**

**Reliability & Grade Bumping**

## **DO WE HAVE TO DESIGN FOR REFLECTIVE CRACKING?**

**MAYBE, BUT WE HAVE THE TOOLS  
AVAILABLE TO AVOID IT:**

- **Full Depth Reclamation**
- **Cold In-Place Recycling**



## **COLD WEATHER REGIONS**

**In some cases we do not currently have asphalt binders available to meet climatic conditions**

**Design for cracking (e.g. control and accommodate)**

**Iqaluit**



# DISCUSSION TO FOLLOW

