

# Contents

Acknowledgements	<u>xi</u>
Preface	<u>xiii</u>
A Note on Units	<u>xv</u>
Introduction	<u>xvii</u>
About this Book	<u>xxiii</u>

## CHAPTER 1

<b>Flotation/Ground Vehicle Compatibility</b>	<b><u>1</u></b>
<b>Common Concepts in Ground Compatibility</b>	<b><u>3</u></b>
General Overview	<u>3</u>
California Bearing Ratio	<u>5</u>
Modulus of Subgrade Reaction, $k$	<u>10</u>
Ground Compatibility Nomenclature	<u>11</u>
Ground Contact Pressure	<u>13</u>
Landing Gear Arrangement Nomenclature	<u>15</u>
<b>Ground Compatibility (Flotation) Analysis</b>	<b><u>17</u></b>
Unpaved Surfaces	<u>17</u>
Soil and Grass	<u>18</u>
Unpaved Analysis Method ASD-TR-68-34	<u>19</u>
Alternative Unpaved Analysis Methods	<u>33</u>
Gravel/Aggregate Airfields	<u>33</u>
Paved Surfaces	<u>35</u>
Pavement Design Analysis	<u>36</u>
<i>Layered Elastic and Finite Element Analysis</i>	<u>36</u>
<i>Flexible Pavements-Historic Approach</i>	<u>42</u>
<i>Rigid Pavements-Historic Approach</i>	<u>47</u>
Pavement Strength Reporting Methods	<u>51</u>
<i>Load Classification Number/Load Classification Group Method</i>	<u>51</u>
<i>Modern Methods for Paved Runways—ACN/PCN and ACR/PCR</i>	<u>54</u>
ACN/PCN	<u>54</u>
ACR/PCR	<u>60</u>
Membrane and Mat Surfaces	<u>62</u>
PCASE Software for Flotation Analysis	<u>65</u>

Engineered Materials Arresting Systems (EMAS)	67
Snow and Ice Runways	69
Prepared Snow Runways	69
Ice Runways	71
Helidecks and Heliports	75
Naval Vessels/Aircraft Carriers	77
Aircraft Carriers	79
Amphibious Warfare Ships	79

**CHAPTER 2**

<b>Maneuvering</b>	<b>81</b>
<b>ICAO Airport Standards</b>	<b>81</b>
<b>Required Maneuvers—NAS3601</b>	<b>86</b>
<b>Required Maneuvers—Land-Based Military Aircraft</b>	<b>88</b>
<b>Required Maneuvers—Shipboard Military Aircraft</b>	<b>88</b>

**CHAPTER 3**

<b>Surface Texture and Profile</b>	<b>89</b>
<b>Paved Runways</b>	<b>89</b>
Micro/Macrotexture	89
<b>Runway Roughness/Profile and Obstacles</b>	<b>92</b>
Roughness Measurement Techniques	93
Power Spectral Density Approach	93
Boeing Bump Method	95
International Roughness Index	96
Short Wavelength Roughness	96
ProFAA Roughness Evaluation Tool	96
Industry Standard Roughness Profiles	97
Bomb Damage Repair	103
Arrestor Cables	107
Unsurfaced Runways	108
<b>Deck/Helideck</b>	<b>108</b>

Appendix A: 100 Busiest airports showing runway size and strength	<u>111</u>
Appendix B: Example ACN values for a variety of aircraft	<u>121</u>
Appendix C: Runway Roughness Profiles	<u>131</u>
References	<u>161</u>
Index	<u>165</u>