

March 25, 2003.

**Subject : FOD\*BOSS Airport Speed Sweeper**

Dear Sirs,

We appreciate you gave us the opportunity to present the **FOD\*BOSS** to the \*\*\*\* Apron Safety Committee and attended a trial on January 22 around the Pier A

This trial, although limited to a few minutes and performed in rainy conditions, proved the efficiency of the **FOD\*BOSS** as an impressive quantity of various FOD has been collected.

In order to demonstrate what the **FOD\*BOSS** can do for you specifically at \*\*\*\* Airport, AIMS has since proceeded with three sweeping operations around the same part of the Pier A at intervals of three to four weeks.

The amount of FOD collected is just amazing !



There is a potential **danger to operations** and the **FOD\*BOSS** is here to help you reducing and controlling this risk.

In total, the quantities picked up by the **FOD\*BOSS** were :

- 24/01/2003 : 27.9 kg on 18 gates.
- 14/02/2003 : 23.1 kg on 18 gates.
- 13/03/2003 : 21.6 kg on 16 gates.

So much FOD collected, and hence generated, during a few weeks is very unusual especially as the \*\*\*\* sweeping machine has probably swept the same areas between the **FOD\*BOSS** passes, making even higher the total FOD quantity actually generated there.

We investigated further the FOD collected in order to help identifying its origin and hence fight it at the very source. We broke it down into 5 categories after their origins :

1. Cabin : Paper cups, plastic stirring sticks, soft drink cans, catering galley seals,...
2. Baggage : Wheels, hooks, zippers, tags,...
3. Mechanical : equipment parts and components, washers, bolts, safety wires, tools,...
4. Pavement debris & miscellaneous : loose stones, aircraft wheel chock splinters, pavement joint gaskets, wooden splinters, ...
5. Sand : loose sand and small particles as sieved at <5mm.



**"Cabin" FOD.**

1.3 kg on 24/01/03.

1.0 kg on 14/02/03.

0.5 kg on 13/03/03.



**Baggage FOD.**

3.7 kg on 24/01/03.

2.0 kg on 14/02/03.

1.7 kg on 13/03/03.



**Mechanical FOD.**

1.8 kg on 24/01/03.

0.9 kg on 14/02/03.

0.7 kg on 13/03/03.



**Pavement Debris and Miscellaneous.**

6.1 kg on 24/01/03.

5.1 kg on 14/02/03.

2.0 kg on 13/03/03.



## Top of the Pops.



These **117** zippers were part of the "Baggage FOD" collected on 14/02/03.

They have been "generated" on 18 gates during 3 weeks only, i.e. after the previous **FOD\*BOSS** pass. There may be more zippers in total as others were picked up in between by the \*\*\*\* sweeping machine or any person conscious about FOD.

Considering that the same *treatment* is applied on the \*\*\*\* and in the baggage sorting hall, this turns out in having probably +10 000 passengers per year receiving their luggage back with a missing zipper. Applying the same to lost padlocks, hooks, tags, and associated damage, there are probably +100 000 passengers per year who would blame the Airline, the Handling company, the Airport or whomsoever they think is responsible.

It is advisable this issue be addressed.

As you have already seen, the **FOD\*BOSS** picks up nearly everything, whether the FOD is magnetic or non-magnetic, small of large, on dry or wet pavement, and all this at a speed of about 30 km/hr, i.e. much faster than conventional sweeping machines. Complemented by such "Find the Root Cause" approach, it will enable you to :

- Eliminate the FOD from the Apron.
- Quantify it.
- Reduce its generation, right at the source.

We remain at your service.

Yours Faithfully,

Marc Flamme.

# FOD\*BOSS. Foreign Object Debris Speed Sweeping System.

Date :        24/01/03

**Area swept :** **56 400 m<sup>2</sup>** 52% of Gates area, including Services Drives  
62% of Total area, without Services Drives

**Total FOD collected :** **27.9 kg**  
**Number of gates swept :** **18**  
58%

2 809 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	3 286 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 204 m <sup>2</sup>	4 060 m <sup>2</sup>
140	142	144	146	148	150	152	154	156	<b>158</b>	160	162	164	<b>166</b>	<b>168</b>	<b>170</b>	172
4.9%	4.9%	4.2%	4.0%	4.5%	3.4%	2.9%	3.1%	3.3%	4.1%	4.1%	2.4%	2.1%	1.7%	1.4%	1.1%	1.0%

PIER A														
3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	4 340 m <sup>2</sup>	3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 750 m <sup>2</sup>
<b>143</b>	<b>145</b>	<b>147</b>	<b>149</b>	<b>151</b>	<b>153</b>	<b>155</b>	<b>157</b>	<b>159</b>	<b>161</b>	<b>163</b>	<b>165</b>	<b>167</b>	<b>169</b>	
4.7%	4.5%	3.9%	3.9%	3.9%	3.8%	4.1%	4.7%	5.6%	2.9%	1.9%	1.5%	0.8%	0.6%	

During the last 3 weeks, the 18 gates swept have handled 55% of the operations (nber of flights).

**FOD sorted by type :**

	Extrapolation for all gates	Extrapolation for Total Area	Average per 10 000m <sup>2</sup>
Type 1 Cabin Cleaning	1.3 kg	2.4 kg ( <i>pro-rata Ops</i> )	2.9 kg
Type 2 Baggage Parts	3.7 kg	6.7 kg ( <i>pro-rata Ops</i> )	8.0 kg
Type 3 Mechanical	1.8 kg	3.2 kg ( <i>pro-rata Ops</i> )	3.8 kg
Type 4 Msc+Pavement	6.1 kg	11.0 kg ( <i>pro-rata Ops</i> )	13.2 kg
Type 5 Fine Sand	15.0 kg	25.8 kg ( <i>pro-rata m<sup>2</sup></i> )	31.0 kg
<b>Total FOD</b>	<b>27.9 kg</b>	<b>49.2 kg</b>	<b>58.9 kg</b>



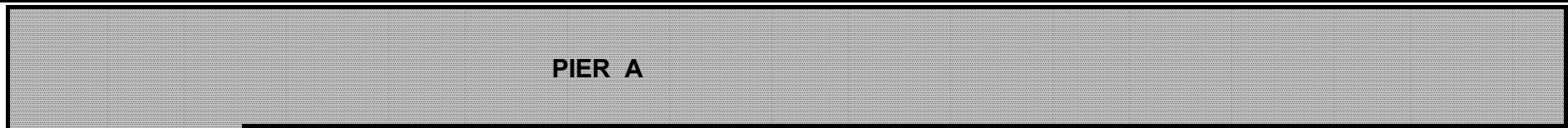
# FOD\*BOSS. Foreign Object Debris Speed Sweeping System.

Date : \_\_\_\_ 14/02/03

**Area swept :** 56 400 m<sup>2</sup> 52% of Gates area, including Services Drives  
62% of Total area, without Services Drives

**Total FOD collected :** 23.1 kg  
**Number of gates swept :** 18  
58%

2 809 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	3 286 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 204 m <sup>2</sup>	4 060 m <sup>2</sup>
140	142	144	146	148	150	152	154	156	158	160	162	162	164	166	168	170	172
4.4%	4.2%	4.1%	3.7%	3.6%	3.3%	3.4%	2.8%	3.1%	3.9%	3.6%	2.7%	2.7%	2.2%	1.9%	1.7%	1.5%	1.3%



3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	4 340 m <sup>2</sup>	3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 750 m <sup>2</sup>
143	145	147	149	151	153	155	157	159	161	163	165	167	169	
4.0%	3.6%	3.8%	3.7%	3.9%	3.7%	3.6%	4.5%	5.3%	4.1%	3.1%	2.2%	1.6%	1.4%	

During the last 3 weeks, the 18 gates swept have handled 56% of the operations (nber of flights).

**FOD sorted by type :**

		Extrapolation for all gates	Extrapolation for Total Area	Average per 10 000m <sup>2</sup>
Type 1 Cabin Cleaning	1.0 kg	1.7 kg (pro-rata Ops)	2.1 kg	0.19 kg
Type 2 Baggage Parts	2.0 kg	3.5 kg (pro-rata Ops)	4.3 kg	0.39 kg
Type 3 Mechanical	0.9 kg	1.6 kg (pro-rata Ops)	1.9 kg	0.18 kg
Type 4 Msc+Pavement	5.1 kg	9.1 kg (pro-rata Ops)	10.9 kg	1.01 kg
Type 5 Fine Sand	14.2 kg	24.5 kg (pro-rata m <sup>2</sup> )	29.3 kg	2.69 kg
Total FOD	23.1 kg	40.4 kg	48.4 kg	4.44 kg

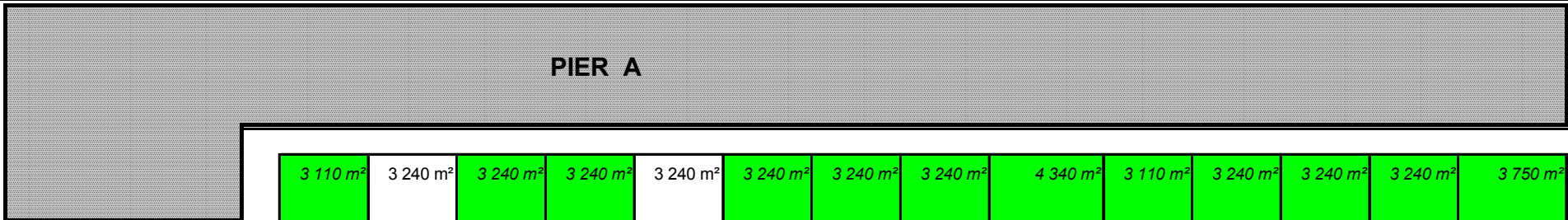


# FOD\*BOSS. Foreign Object Debris Speed Sweeping System. Date : \_\_\_\_ 13/03/03

**Area swept :** **52 600 m<sup>2</sup>** 48% of Gates area, including Services Drives  
58% of Total area, without Services Drives

**Total FOD collected :** **21.6 kg**  
**Number of gates swept :** **16**  
52%

2 809 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 290 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	3 286 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 506 m <sup>2</sup>	2 204 m <sup>2</sup>	4 060 m <sup>2</sup>
140	142	144	146	148	150	152	154	156	158	160	<b>162</b>	<b>164</b>	166	<b>168</b>	170	<b>172</b>
4.0%	4.3%	3.8%	3.4%	2.9%	3.0%	2.0%	2.2%	2.8%	4.1%	3.0%	<b>2.4%</b>	<b>2.4%</b>	2.3%	<b>2.2%</b>	1.8%	<b>1.8%</b>



3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	4 340 m <sup>2</sup>	3 110 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 240 m <sup>2</sup>	3 750 m <sup>2</sup>
<b>143</b>	145	<b>147</b>	<b>149</b>	151	<b>153</b>	<b>155</b>	<b>157</b>	<b>159</b>	<b>161</b>	<b>163</b>	<b>165</b>	<b>167</b>	<b>169</b>	
<b>3.9%</b>	3.4%	<b>3.8%</b>	<b>3.7%</b>	4.0%	<b>3.4%</b>	<b>4.6%</b>	<b>5.1%</b>	<b>5.7%</b>	<b>4.2%</b>	<b>3.5%</b>	<b>2.8%</b>	<b>1.9%</b>	<b>1.6%</b>	

During the last 3 weeks, the 16 gates swept have handled 53% of the operations (nber of flights).

**FOD sorted by type :**

	Extrapolation for all gates	Extrapolation for Total Area	Average per 10 000m <sup>2</sup>
Type 1 Cabin Cleaning	0.5 kg	1.0 kg ( <i>pro-rata Ops</i> )	1.2 kg
Type 2 Baggage Parts	1.7 kg	3.1 kg ( <i>pro-rata Ops</i> )	3.8 kg
Type 3 Mechanical	0.7 kg	1.3 kg ( <i>pro-rata Ops</i> )	1.5 kg
Type 4 Msc+Pavement	2.0 kg	3.8 kg ( <i>pro-rata Ops</i> )	4.5 kg
Type 5 Fine Sand	16.7 kg	32.4 kg ( <i>pro-rata m<sup>2</sup></i> )	38.8 kg
<b>Total FOD</b>	<b>21.6 kg</b>	<b>41.5 kg</b>	<b>49.8 kg</b>





