

Report n° V4 – 61/2002  
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on the

## CHARACTERISTICS OF A BOLLARD SYSTEM REGARDING THE EFFORT REQUIRED FOR REPAIR

### APPLICATION

APPLICANT: ABES Büro Deutschland  
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APPLICATION DATE: 27 August 2002

#### SUBJECT OF APPLICATION:

Confirmation of the effort required to repair  
a damaged bollard



1 | Bollard before damage



2 | Damaged bollard

### MATERIAL

- DESCRIPTION\*: **Metropol bollard with 3p-Technologie including:**
- Ground shell n° 000.001, globular cast iron GGG, embedded at ground level
  - Junction piece, globular cast iron GGG, with hexagon bolt and nut M12, stainless steel 1.4301, n° 000.008
  - Clamping cone, stainless steel 1.4301, Nr. 000.004
  - Anchor, galvanised steel ST 37, n° 000.013
  - Bollard, cast iron GG 20, n° 001.003

SERIAL NUMBER: None

CONDITION: New

\*provided by applicant



3 | Bollard system after damage

The junction piece yields, the bollard falls over and is held to the ground shell by an anchor. The bollard itself, the ground shell and the foundations do not show any visible signs of damage (see figure 3).

The bollard is mounted with a new junction piece within 3 minutes (see figure 4 and figure 5). After repair the bollard is firmly fixed in place.



4 | Junction piece: damaged (right) and replacement (left)



5 | Repairing the bollard

### TEST

A properly installed Metropol bollard with 3p-Technologie is damaged by a car (see figure 1 and figure 2).



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