45TH ASECAP STUDY & INFORMATION DAYS 2017

The Concession model in the decarbonization era: preparing the infrastructure of the future

Pullman Paris Montparnasse Hotel
29-31 May 2017

www.asecapdays.



Organized by ASECAP

Motorways and Mont Blanc Tunnel

MAINTENANCE OF ENGINEERING STRUCTURES

DRONE INSPECTION OF VERY HIGH PILLARS

ASECAP PARIS - APRIL 2017

DRONE INSPECTION OF VERY HIGH PILLARS

ASECAP DAYS
PARIS 2017

Presentation of our engineering works

Surveillance policy

Drone inspection: innovating to safeguard our assets

KEY ASSETS: MOTORWAY ENGINEERING STRUCTURES

ATMB:
in the heart of the Haute-Savoie area, between Switzerland and Italy

KEY ASSETS: MOTORWAY ENGINEERING STRUCTURES

The key assets of the motorway network include civil engineering structures in both peri-urban and mountainous areas.

- 220 works
- 160,000 m² of deck
- One structure every 500m
- Average age of infrastructure: 38 years old

SURVEILLANCE POLICY

Several factors affect ageing:

- Freezing and thawing (altitudes of 400 to 1,200m)
- De-icing salt
- Ageing of structures, carbonation of concrete

➡ **Regular strict checks are required.**

How we monitor the works

- Ongoing surveillance (24/7) by our patrols.
- Annual inspections
- Detailed inspections once every 5 years, using the IQOA method.
  - Conducted by a qualified outside engineering firm
  - Access systems: positive and negative-reach cherry pickers, rope access

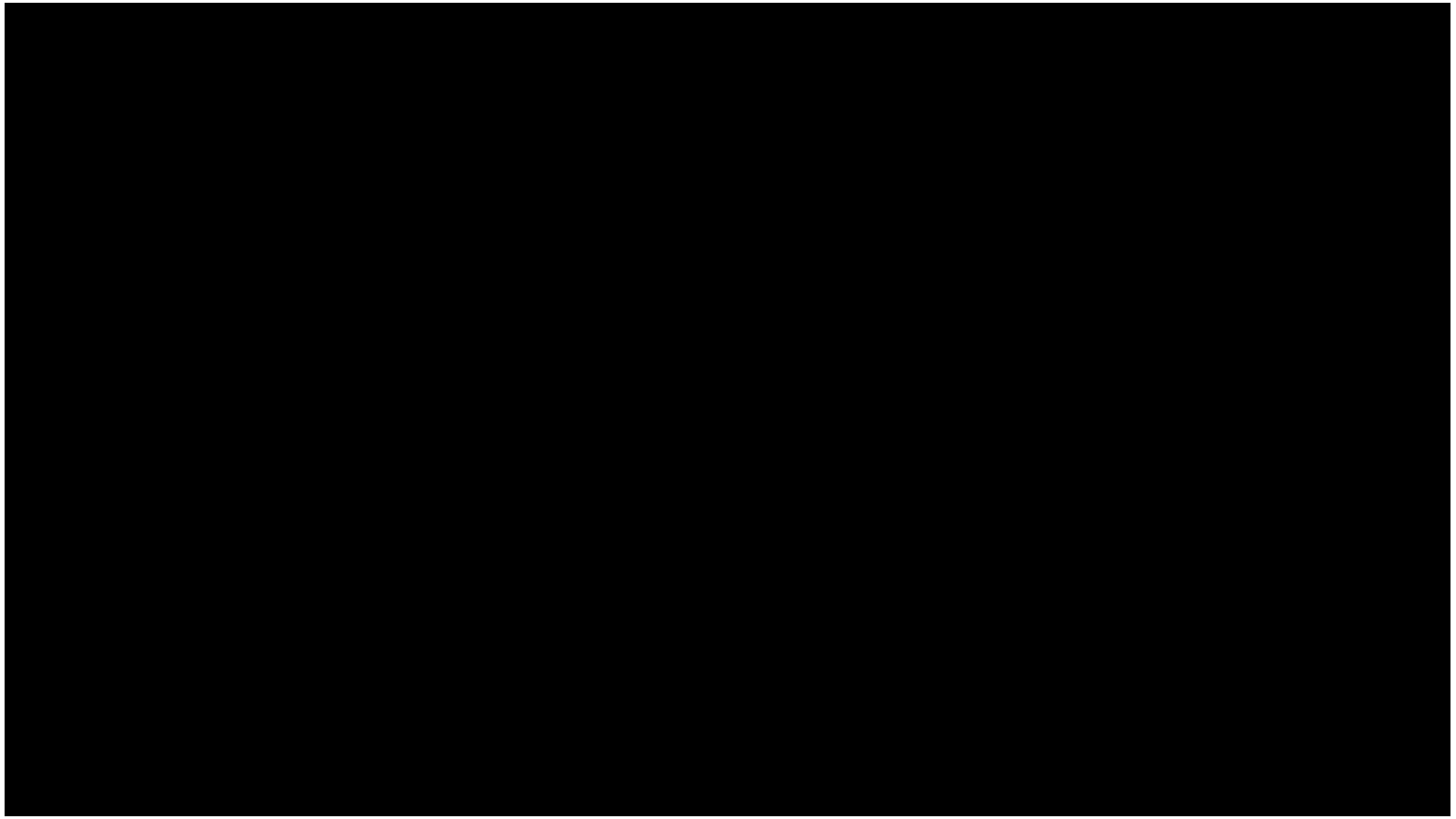
INNOVATING TO SAFEGUARD OUR ASSETS

In late 2015, ATMB tried out drone inspection of two very high pillars on the Egratz viaduct heading for Chamonix.

Mission

- The drone project was conducted by a firm called Diades, which is part of the SETEC Group.
- 2 operators (a pilot and an experienced inspector).
- The drone was flown right up to the pillar.
- 20mn-pixel photographs were shot (1,000 per pillar)
- Georeferencing of data
- Detection of defects smaller than 1 mm.
- 3D modelling of the structure after data compilation

INNOVATING TO SAFEGUARD OUR ASSETS



Defect cartography (e.g. cracking, chipping)

Photo 1
Pile P2 - Vue : EST
Niveau moyen: -19.3 m
Présence d'éclat de béton en formation, d'éclat de béton et d'acier apparent corrodé
(Ph: P2-DSC00078.JPG)

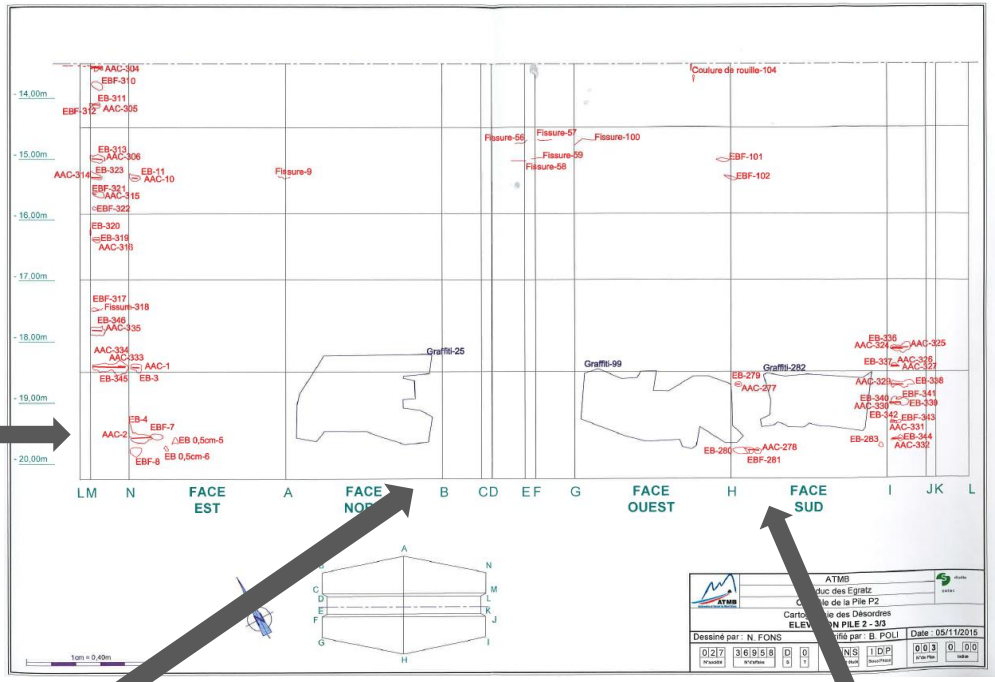


Photo 20
Pile P2 - Vue : SUD
Niveau moyen: -19.3 m
Présence d'éclat de béton, de graffiti, d'éclat de béton en formation et d'acier apparent corrodé
(Ph: P2-DSC00854.JPG)

Photo 24
Pile P2 - Vue : SUD/Est
Niveau moyen: -18.6 m
Présence d'éclat de béton, d'éclat de béton en formation et d'acier apparent corrodé
(Ph: P2-DSC01022.JPG)

Review - advantages of this method

- Ideal equipment for examining very high works, close up
- Saves time, as compared with using rope-access technicians.
- Creation of photo database of all the elements of the structure, in order to closely monitor changes over time.
- Automatic exports of observed defects to AutoCAD files.
- Cost comparable to using rope-access technicians

2017: new undertakings to check the bridges with the highest pillars

- Inspection of 69 very high pillars on 3 bridges.
- Mean height: 38m. Max height: 68m
- Total height: 2650 m

INNOVATING TO SAFEGUARD OUR ASSETS

New mission:

- Shoot 50mn- pixel photographs.
- Georeference data. Detect defects and cracks as small as 0.3 mm.
- 3D modelling of the structure after compilation of all the data.
- Project subcontracted to the firm Drone Ardèche by the Engineering office if the IOA.

The drone: an expert eye in the sky inspecting engineering works

INNOVATING TO SAFEGUARD OUR ASSETS

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Thank you.

Happy motoring.