



GENEVE, SUISSE

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|---------------------------------------|
| CMS-I-UR-0077 EDMS : 738850 |
| CMS – SX5 |
| PLUG LOAD TEST (2500 TONS) |
| CERN – SX5 - MAY 2006 |



The plug with 2500 tons - SX5 – 15/05/2006

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1 Introduction

1.1 Needs

Following John OSBORNE's request several reference points on the plug at SX5 have been measured on different steps during the load test :

- No load
- 500 tons
- 1000 tons
- 1500 tons
- 2500 tons (after 1000 tons insertion)
- No load : **not measured** : the plug has been opened on the 17th of May 2006 at 23h00 due to the humidity in the cavern.

In addition the plug has been measured during the insertion of the 1000 tons on the 15th of May 2006.



Figure 1. Insertion of the 1000 tons on the plug – 15/05/2006

1.2 Measurements

The measurement was done at CERN – SX5:

- ✓ On the 08th of May 2006 for the initial measurement : no load
- ✓ On the 10th of May 2006 for the measurement with a 500 tons load.
- ✓ On the 11th of May 2006 for the measurement with a 1000 tons load.
- ✓ On the 12th of May 2006 for the measurement with a 1500 tons load.
- ✓ On the 15th of May 2006 for the measurement with a 2500 tons load.

Remark :

The plug with no load (after the 2500 tons) was not measured : the plug has been opened on the 17th of May 2006 at 23h00 due to the humidity in the cavern.

The measurement was done on at CERN SX5.
Accuracy (RMS / XYZ): 0.1 mm



Figure 2. 1000 tons insertion

2 Point numbering

About 20 points have been installed for the plug load test.

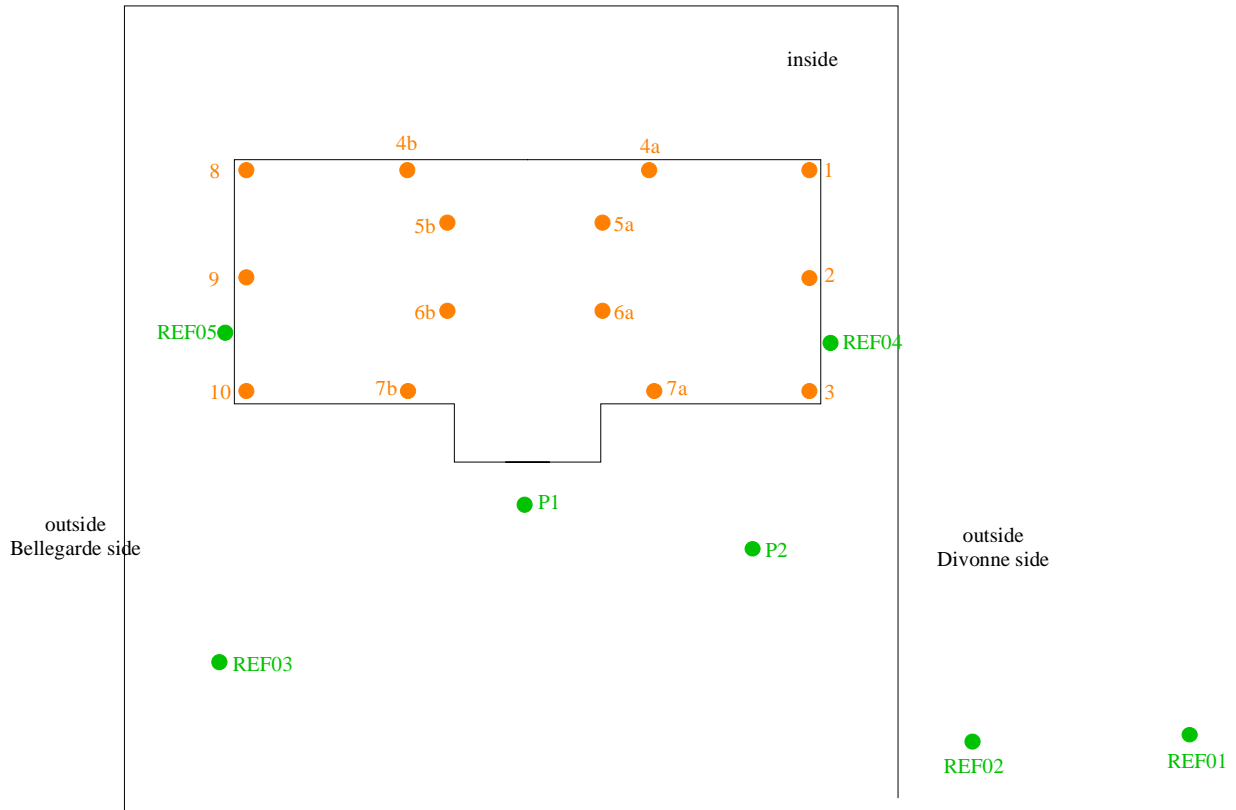


Figure 3. Top view of the pug

- 14 points have been installed on the concrete surface of the plug following the indication given by the drawing CMS-OUT-0045 : points 1 to 10
- 5 reference fixed points have been installed : points REF01 to REF05
- 2 additional points have been used for the measurements : points P1 and P2

3 Results of the load test

The 14 references points have been measured at different steps :

- ✓ On the 08th of May 2006 for the initial measurement : no load
- ✓ On the 10th of May 2006 for the measurement with a 500 tons load.
- ✓ On the 11th of May 2006 for the measurement with a 1000 tons load.
- ✓ On the 12th of May 2006 for the measurement with a 1500 tons load.
- ✓ On the 15th of May 2006 for the measurement with a 2500 tons load.

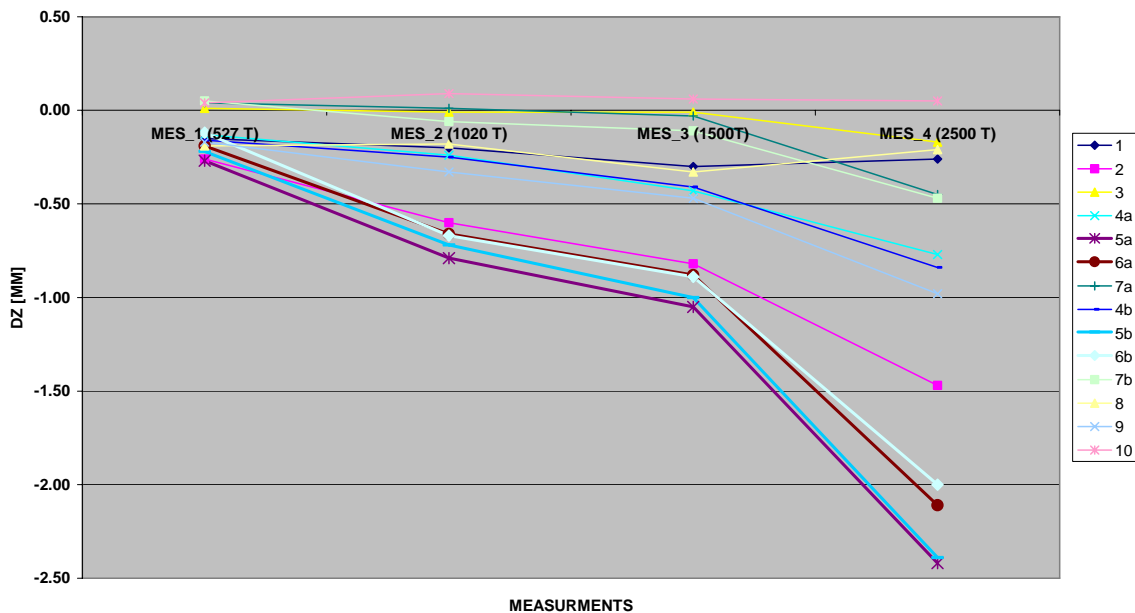
Remark :

The plug with no load (after the 2500 tons) was not measured : the plug has been opened on the 17th of May 2006 at 23h00 due to the humidity in the cavern.

Values are given in [mm]

| POINT | MES_1 (527 T) | MES_2 (1020 T) | MES_3 (1500T) | MES_4 (2500 T) |
|-------|---------------|----------------|---------------|----------------|
| 1 | -0.1 | -0.2 | -0.3 | -0.3 |
| 2 | -0.3 | -0.6 | -0.8 | -1.5 |
| 3 | 0.0 | 0.0 | 0.0 | -0.2 |
| 4a | -0.1 | -0.2 | -0.4 | -0.8 |
| 5a | -0.3 | -0.8 | -1.1 | -2.4 |
| 6a | -0.2 | -0.7 | -0.9 | -2.1 |
| 7a | 0.0 | 0.0 | 0.0 | -0.5 |
| 4b | -0.2 | -0.3 | -0.4 | -0.8 |
| 5b | -0.2 | -0.7 | -1.0 | -2.4 |
| 6b | -0.1 | -0.7 | -0.9 | -2.0 |
| 7b | 0.1 | -0.1 | -0.1 | -0.5 |
| 8 | -0.2 | -0.2 | -0.3 | -0.2 |
| 9 | -0.2 | -0.3 | -0.5 | -1.0 |
| 10 | 0.0 | 0.1 | 0.1 | 0.0 |
| MAX | 0.1 | 0.1 | 0.1 | 0.0 |
| MIN | -0.3 | -0.8 | -1.1 | -2.4 |

PLUG LOAD TEST



4 1000 tons load insertion

Four points on the plug have been measured during the 1000 tons insertion.

- Initial values at 9h20 before the insertion
- Insertion from 9h35 to 10h15
- 3 measurements have been done after the insertion : 10h45, 12h10 and 14h10

| Points | 9h20 | 9h35 | 9h45 | 9h50 | 9h55 | 10h05 | 10h15 | 10h45 | 12h10 | 14h10 |
|--------|------|------|------|------|------|-------|-------|-------|-------|-------|
| 6a | 0.0 | -0.4 | -0.5 | -0.8 | -0.9 | -1.2 | -1.3 | -1.4 | -1.3 | -1.3 |
| 5a | 0.0 | -0.2 | -0.3 | -0.7 | -0.9 | -1.0 | -1.3 | -1.3 | -1.4 | -1.4 |
| 6b | 0.0 | -0.4 | -0.4 | -0.7 | -0.8 | -1.1 | -1.2 | -1.2 | -1.3 | -1.4 |
| 5b | 0.0 | -0.4 | -0.4 | -0.8 | -0.7 | -0.9 | -1.2 | -1.2 | -1.4 | -1.4 |

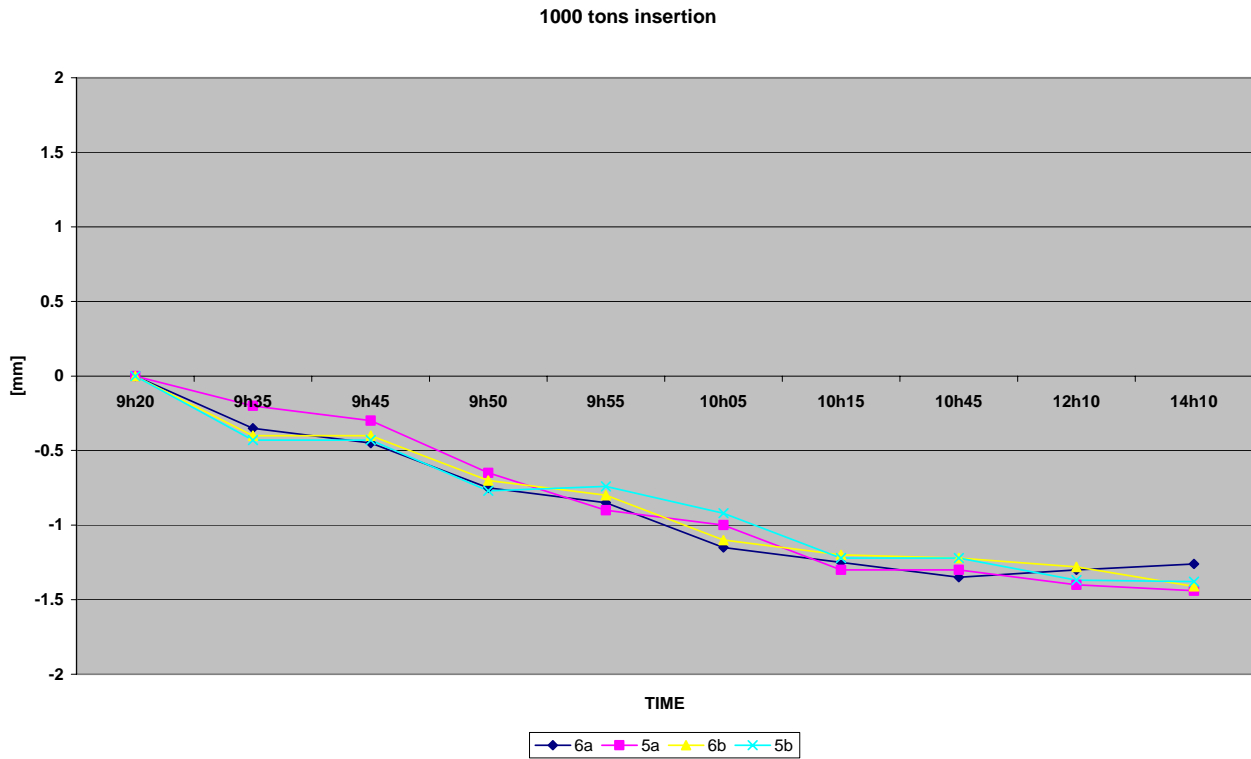


Figure 4. Points 5a, 6a, 5b and 6b – Values are given in mm