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MONITORING OF DEFORMATION OF HISTORICAL STRUCTURES

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Main goal of monitoring :

- **to explain causes of damages**

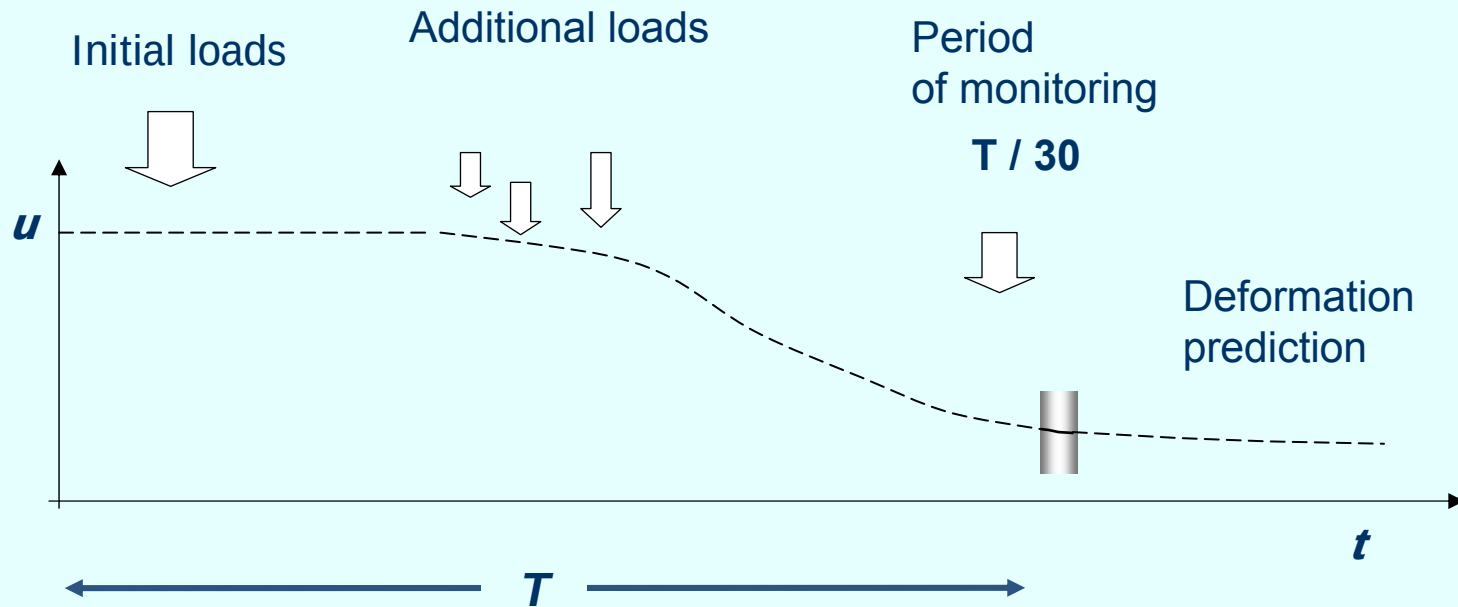
Detailed goals :

- trend of displacements and deformations
- gradients
- asymptotes
- cycles
- absolute values of displacements
- correlation of displacements and temperature
- correlation of displacements and geotechnical conditions

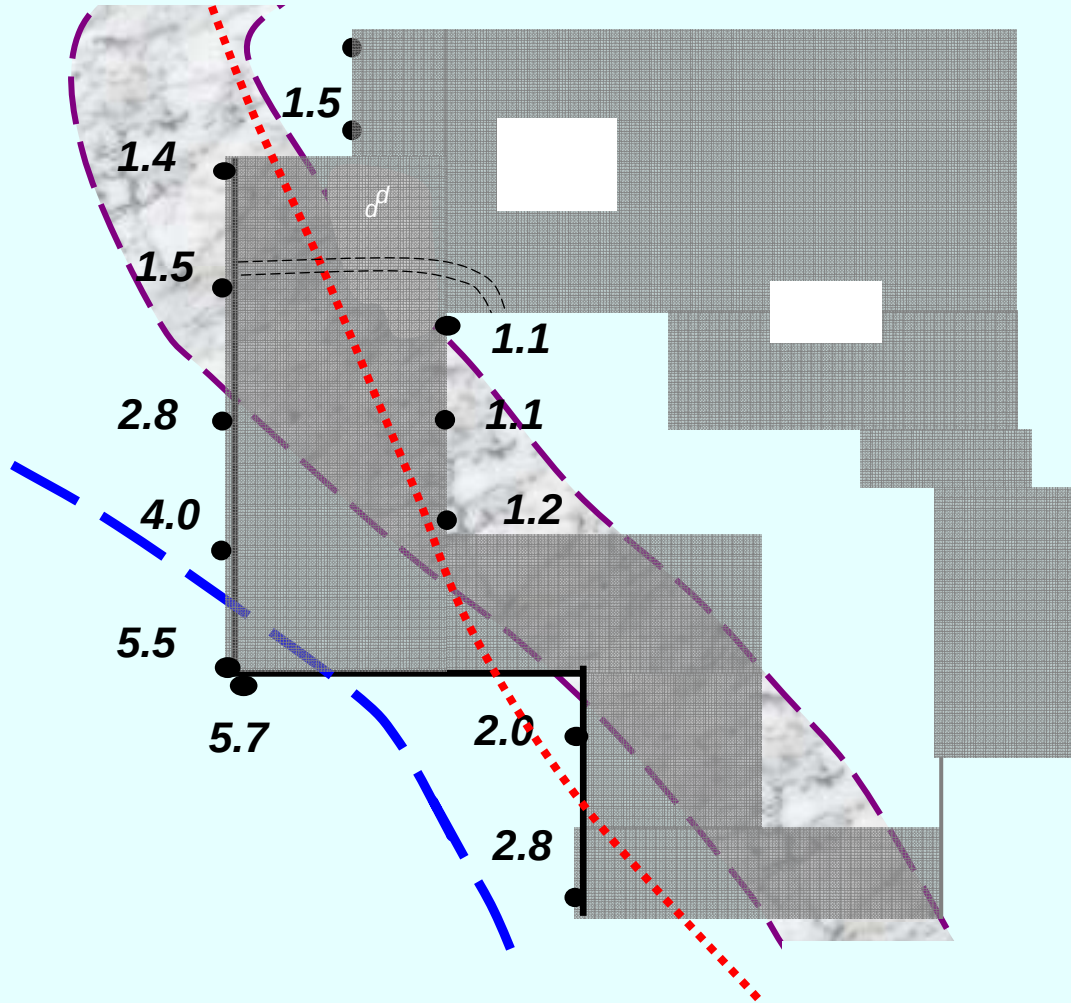
Archeological Museum in Cracow



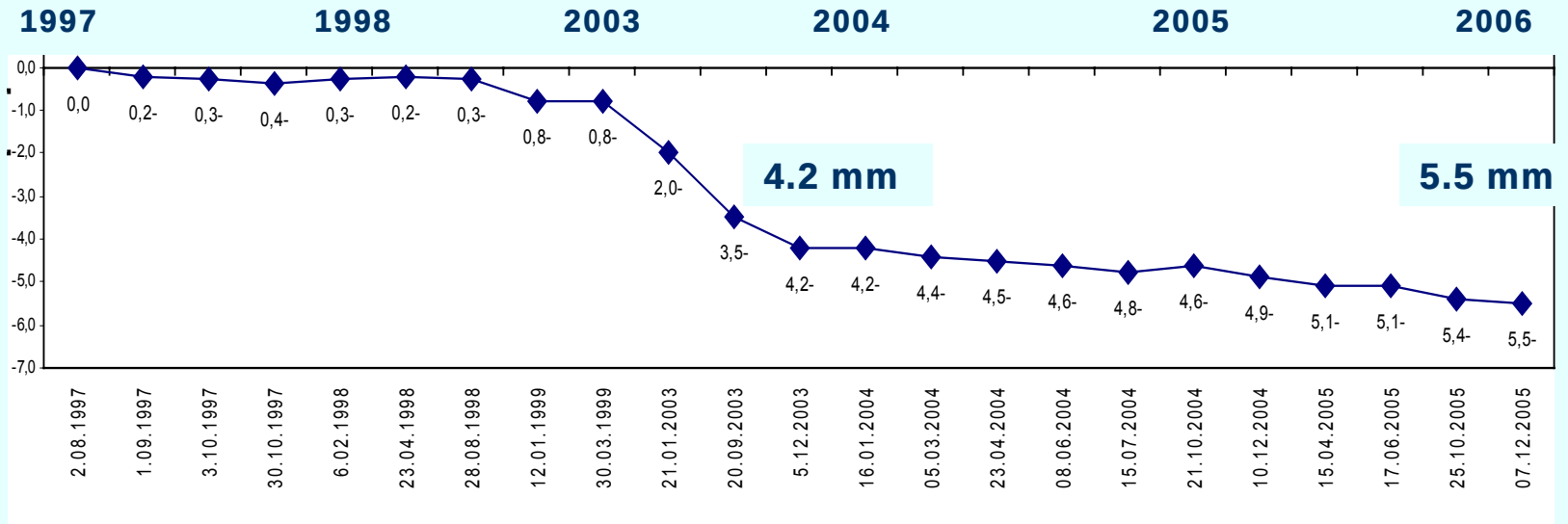
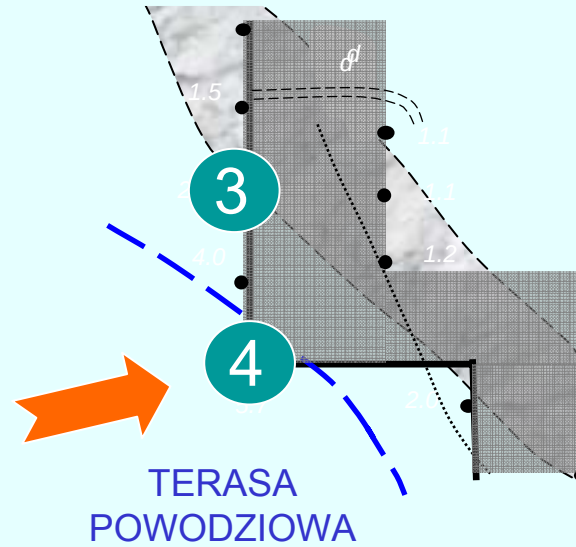
Features of monitoring



Settlements in the period of 1997- 2006

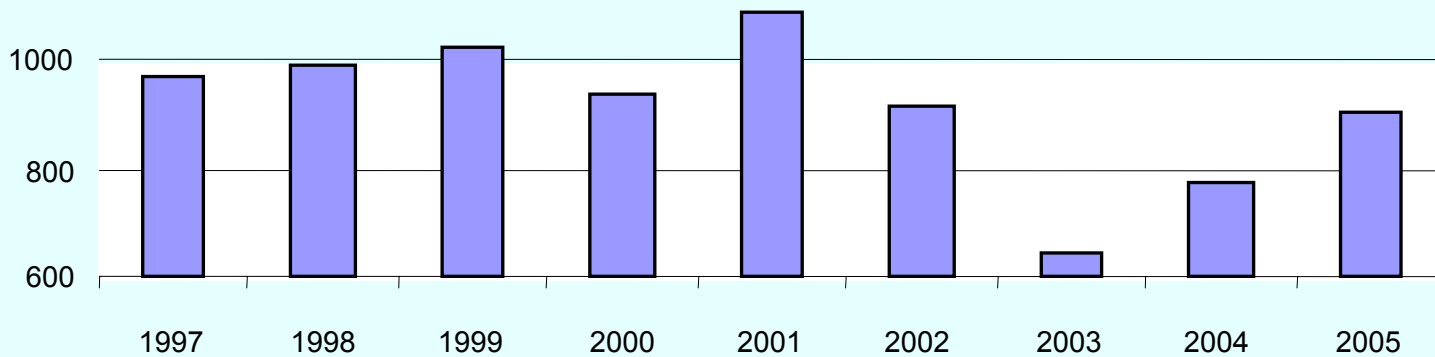


Settlements : point 4



Impact of long-term drought

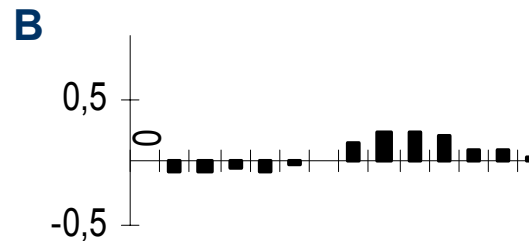
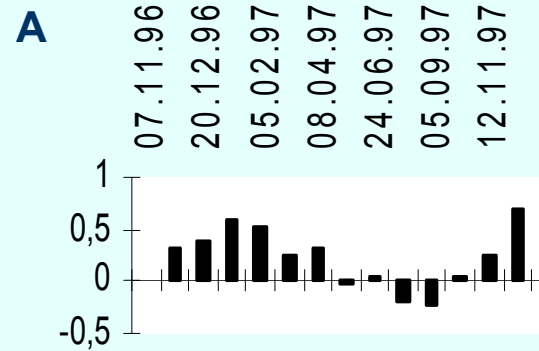
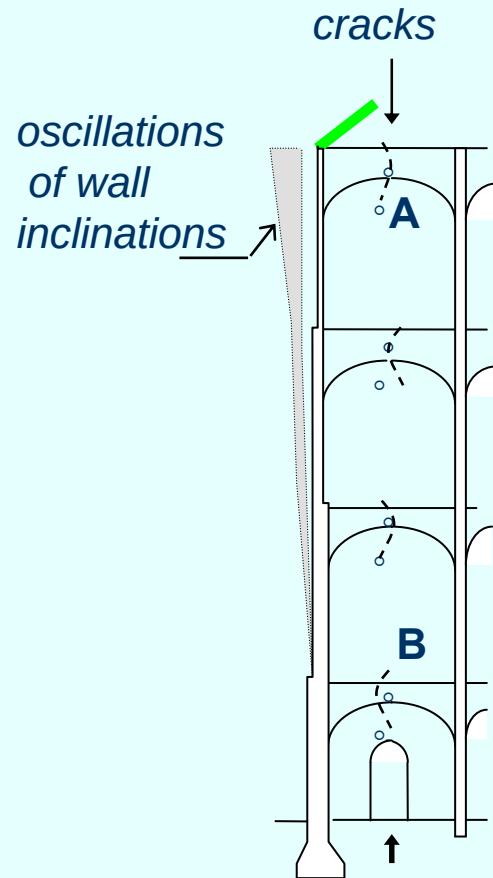
Annual rainfall [mm]



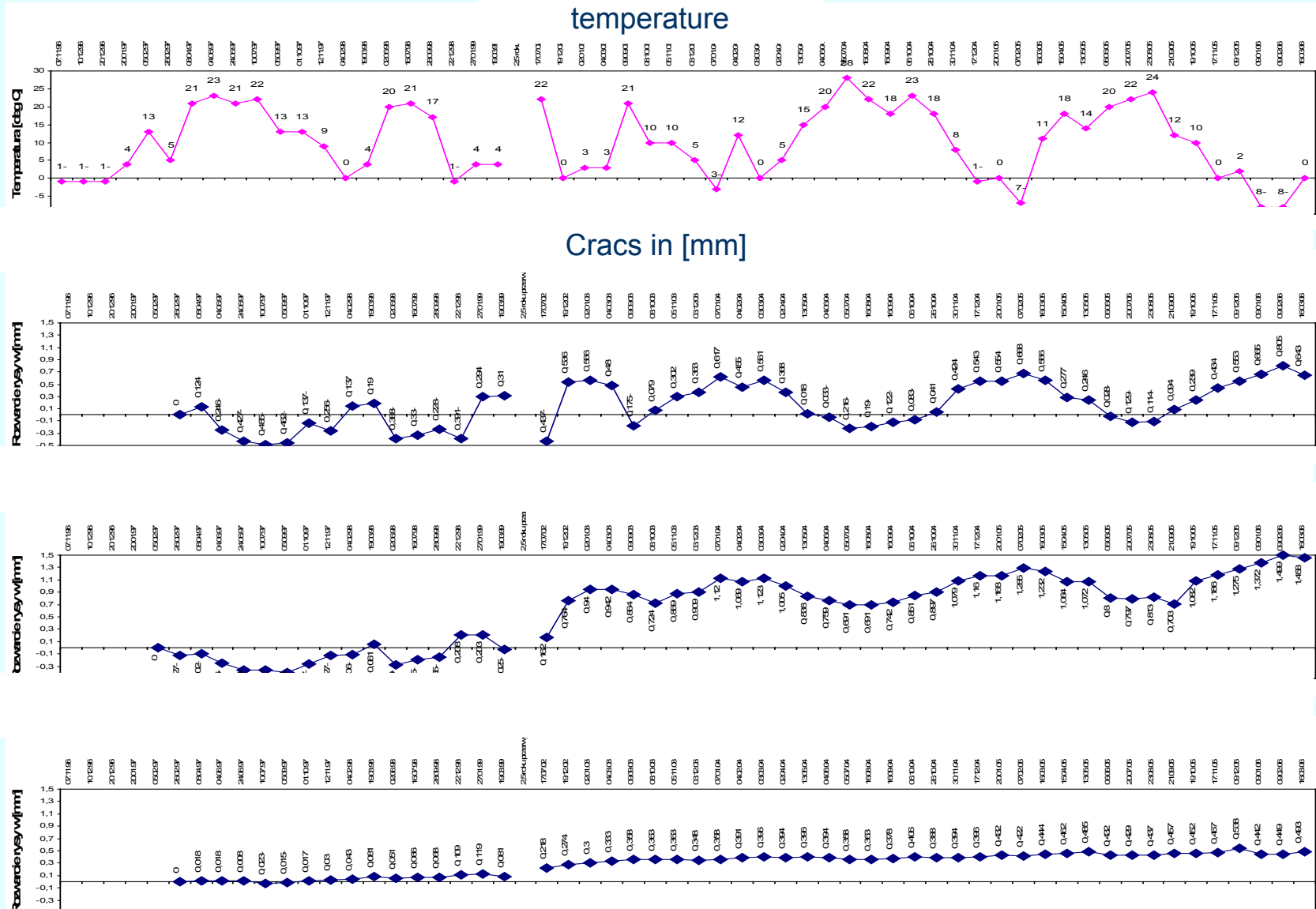
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Deformation cycles

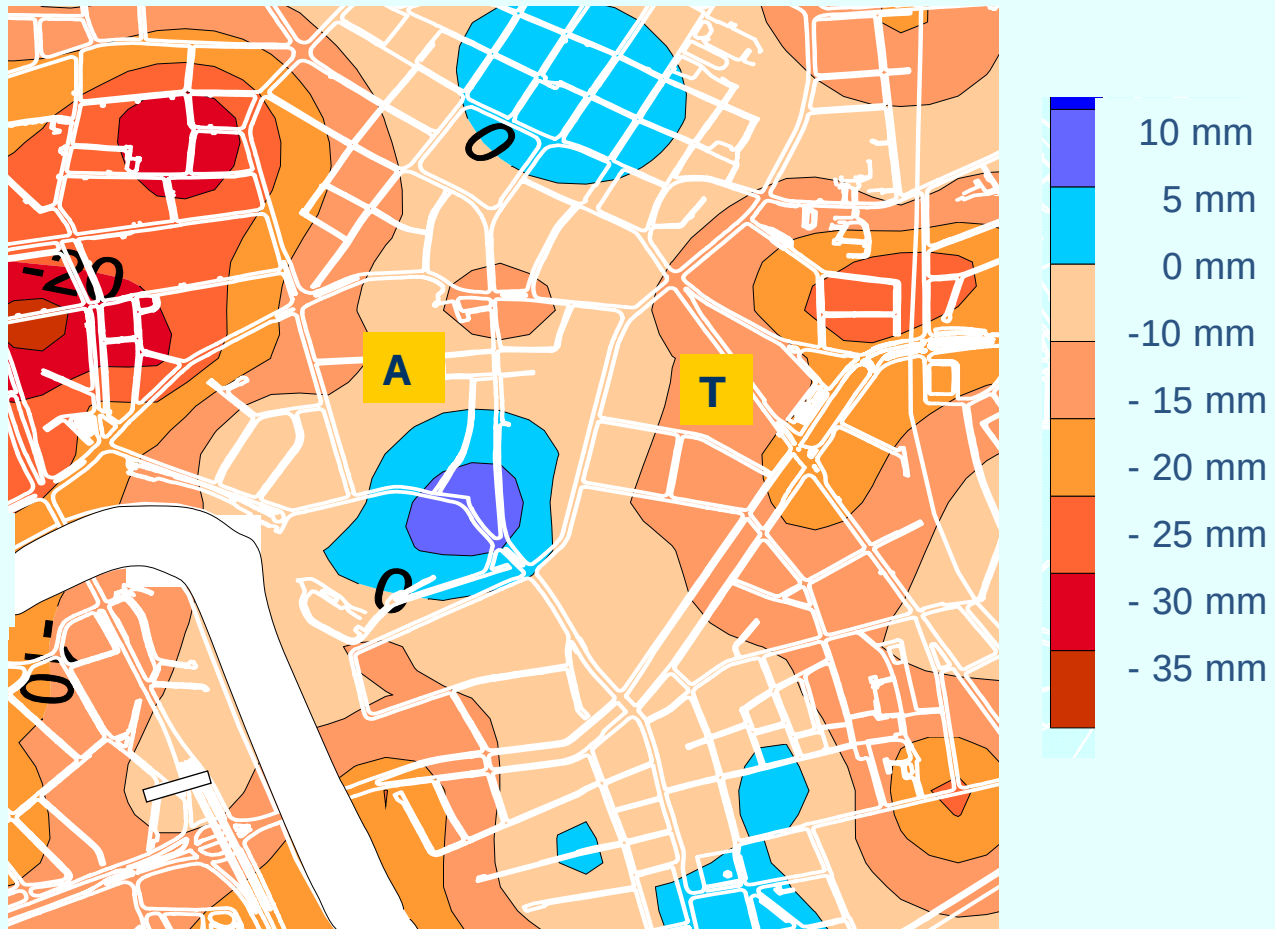


Changes in cracks widths - temperature

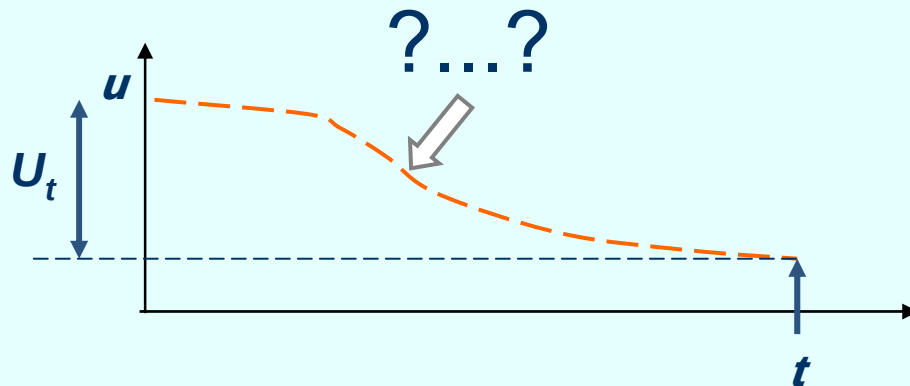
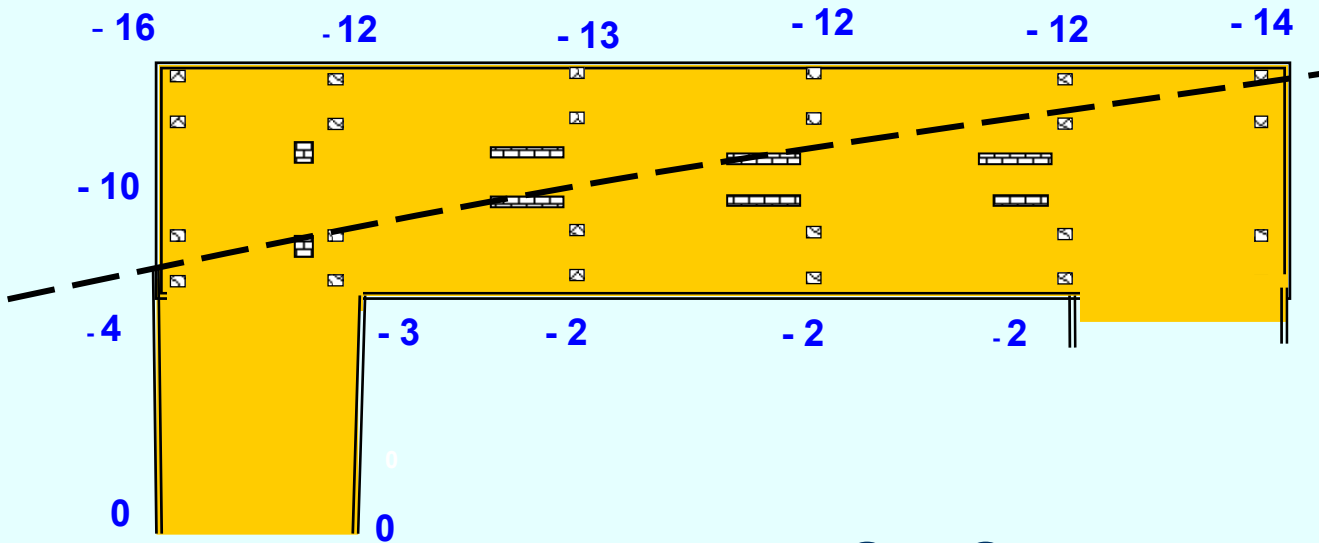


Settlements of buildings in central districts of Cracow 1970 - 2003

A -Museum



Absolute values of vertical displacements [cm]



CONCLUSIONS

- **Monitoring of historical buildings needs long-term observations. Structures with small damages should be observed as early as possible**
- **Program of monitoring should be focused at features of identified process, viz. gradients, asymptotes, cycles and absolute values of displacements and deformations and correlations of features.**
- **Observations of cracks should be carried out in the whole building space.**
- **A role of temperature should be considered as influence at accuracy of measurement and changes of deformation observed in changes in crack widths.**
- **Geotechnical conditions of survey area should be taken into consideration at analysis of levelling reference systems .**

