

# Quality of visual sewer inspection data: the need for a new coding system?!



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## Introduction

Previous research learned that the reproducibility of visual sewer inspection data is poor (Dirksen et al.). Further research by Arjan et al. showed that the applied coding system has a major influence on the reproducibility. The aim of this study was to give relevant suggestions to improve the quality by defining defects that are in the current standard defined ambiguously (i.e. can be understood in more than one way). For this, the database of sewer examination data of graduated sewer inspectors in the Netherlands was studied.

## Results

Evaluation of the way how clearly visible features shown on the photographs are reported by the candidates showed that the results are very much depended on the inspector (not reproducible). It is shown that the difference between the following defects is not clear:

- Fissure (BAB) and break collapse (BAC)
- Attached deposits (BBB), settled deposits (BBC) and ingress of soil (BBD)
- Other obstacles (BBE) and settled deposits (BBC)

For the following defects there is a high possibility of being overlooked:

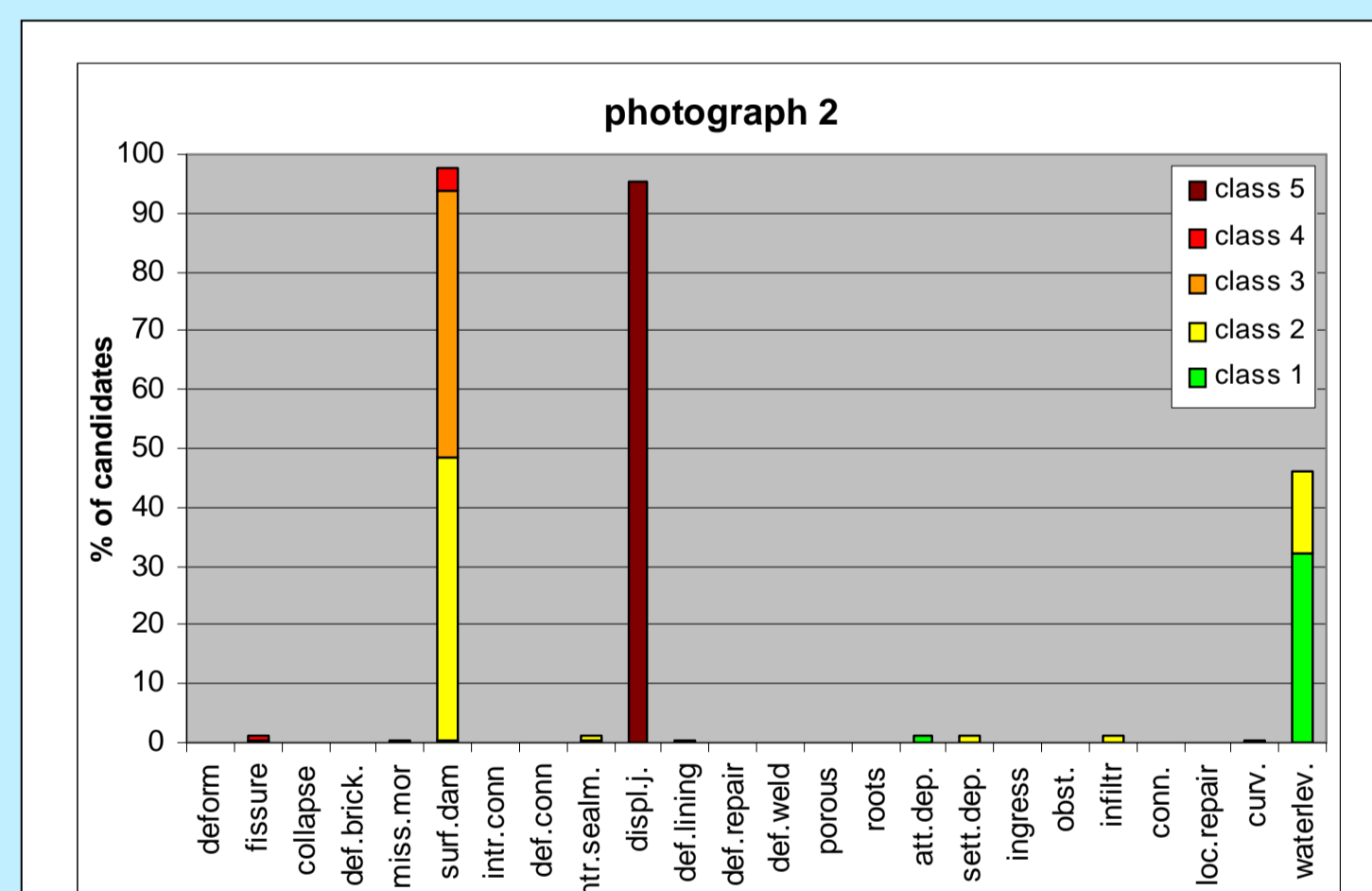
- Intruding sealing material (BAI)
- Mechanical damage (BAF-A)

Furthermore the differentiation between fine and coarse deposits proved impossible.

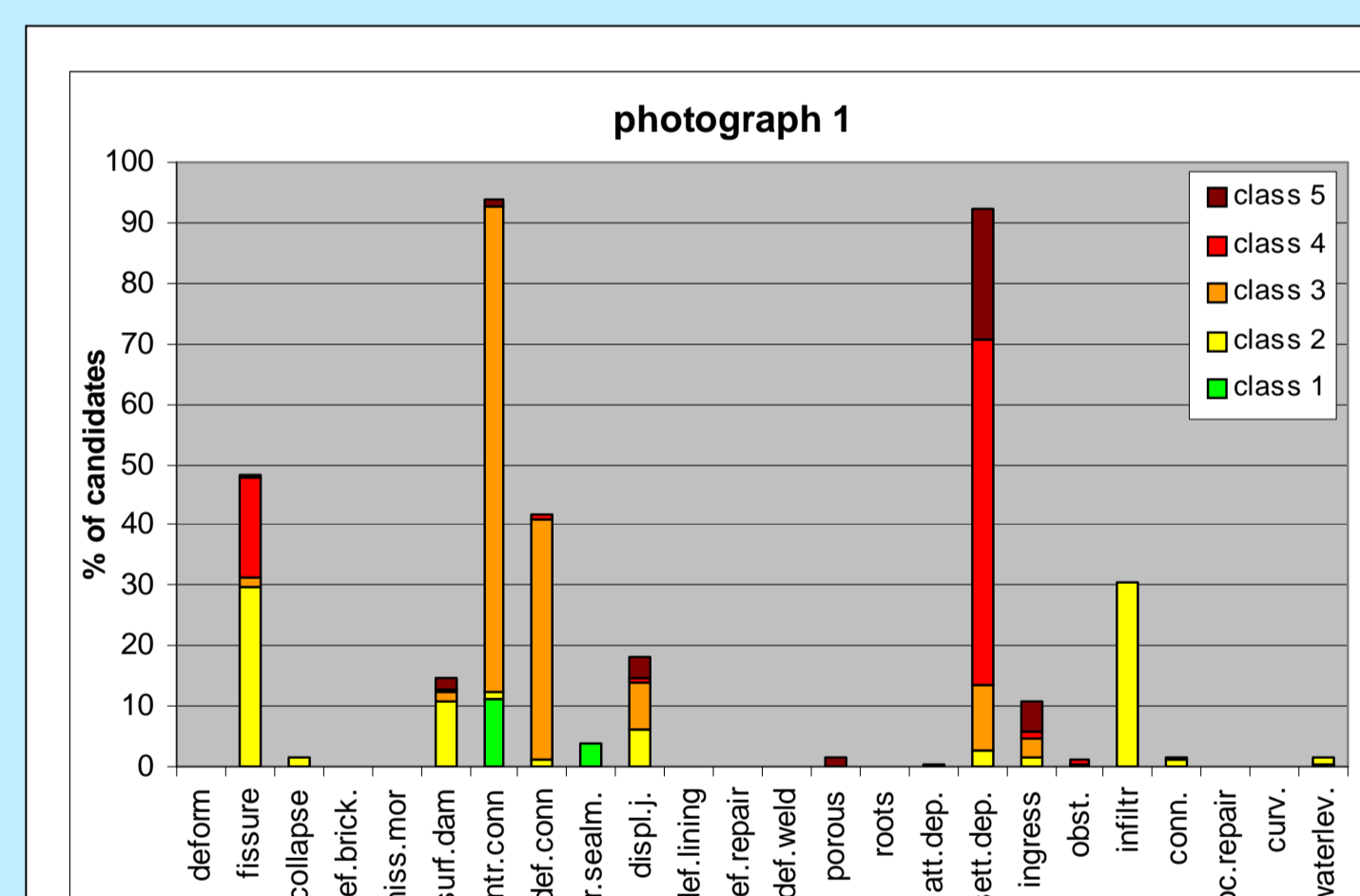
As only ten photographs were used for the examination, this list of ambiguities is probably only the tip of the iceberg.

## TEST YOUR OWN SKILLS!

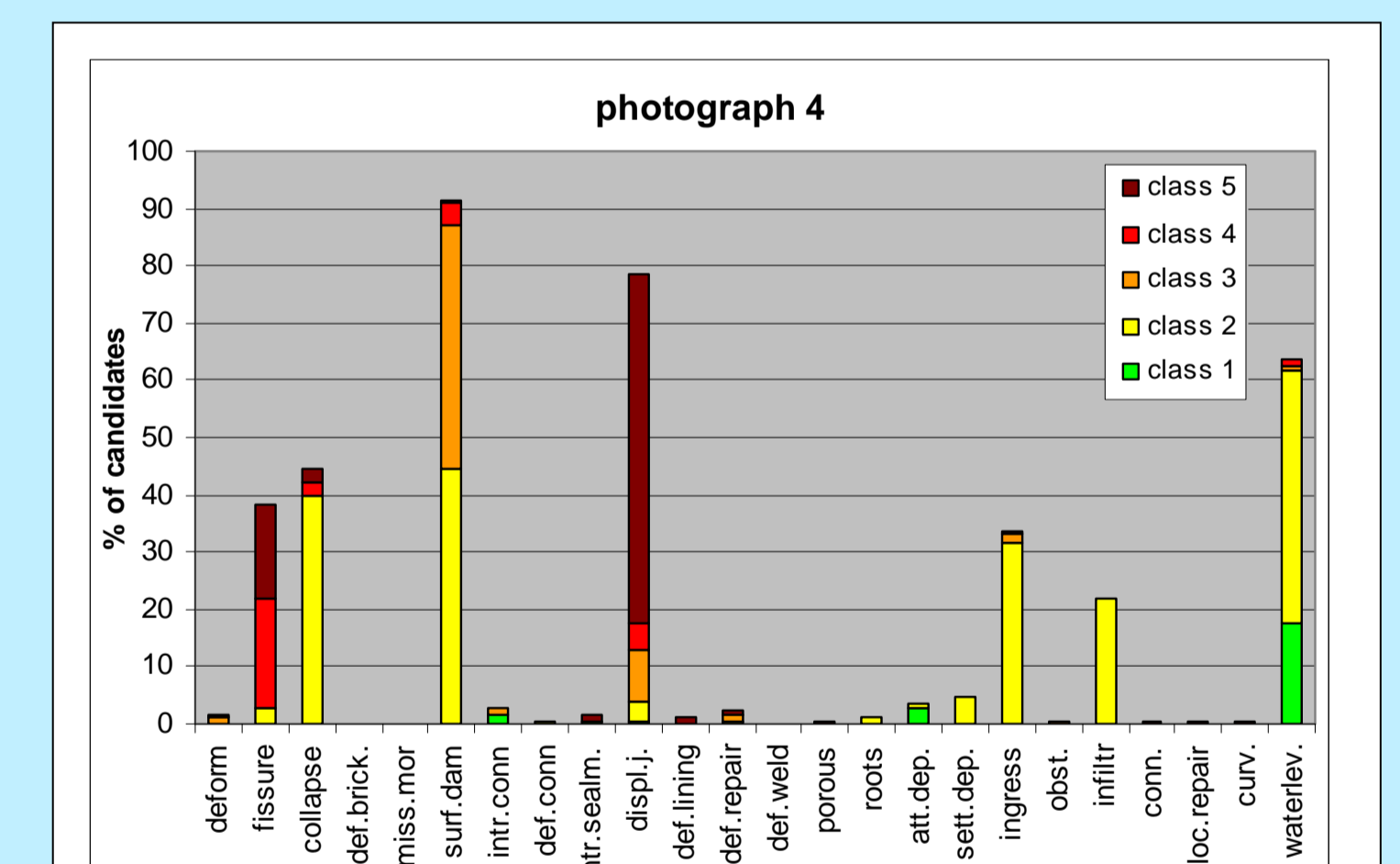
Below you find three photographs used for the examination. Look carefully at the photographs and decide which defects are present (you find a list of defects below the poster). If you flip the image, you find the answers given by the candidates.



From the graph it is clear that the defects of the sewer shown in this photograph were easy to recognize: surface damage and a displaced joint (it is not obligatory to denote water level class 1:  $h < 10\%$  of the diameter).



The responses of the candidates do not make clear what kind of defects were present in the photographed sewer. For this sewer the candidates did not agree on the presence of the defects fissure, defective connection, displaced joint and infiltration.



Photograph 4 shows a sewer with a crack on the soffit and bottom of the pipe. Two thirds of the candidates recognized this crack and described it as a fissure (36%), collapse (26%) or both (18%).

## References

Steen, van der, A.J. Dirksen, J. Clemens, F.H.L.R. Accepted. Visual sewer inspection: detail of coding system versus data quality? *Structure and Infrastructure Engineering*.  
Dirksen, J., Clemens, F.H.L.R., Korving, H., Cherqui, F., Le Gauffre, P., Ertl T., Plihal, H., Müller, K., Snaterse, C.T.M. 2013. The consistency of visual sewer inspection data. *Structure and Infrastructure Engineering*, 9 (3), 214-228.

## MAIN CONCLUSION

In order to improve the quality of visual sewer inspection data the complexity of the (European) coding system should be drastically reduced.