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## Plan Overview

*A Data Management Plan created using DMPonline*

**Title:** Computational modeling of interaction between in-plane and out-of-plane behavior in masonry walls

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**Template:** TU Delft Data Management Plan template (2021)

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### Project abstract:

The majority of the studies in the literature on unreinforced masonry (URM) walls focus on the response of the walls to either in-plane or out-of-plane loading separately. However, it is evident that in real-world constructions the walls are excited simultaneously in the two directions, such as by earthquakes, and the response of the components in each direction influences the behavior in the other one. The current project will fill the knowledge gap on the interaction of simultaneous or sequential in-plane and out-of-plane damages in masonry walls. First robust and reliable predictive computational means will be identified. This scope will be achieved by comparing different modeling approaches (e.g. 3D brick-to-brick or continuum modeling) and improving/extending existing constitutive models and solution techniques. In a second phase, the project will investigate whether and how existing damage in URM walls affects their performance at the ultimate limit state; in other words, whether existing cracks affect the near-collapse state of the walls and, hence, of the buildings.

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# Computational modeling of interaction between in-plane and out-of-plane behavior in masonry walls

## 0. Administrative questions

### 1. Name of data management support staff consulted during the preparation of this plan.

My faculty data steward, [Ms. Lora Armstrong](#), reviewed this DMP on June 7, 2022.

### 2. Date of consultation with support staff.

2022-05-31

## I. Data description and collection or re-use of existing data

### 3. Provide a general description of the type of data you will be working with, including any re-used data:

Type of data	File format(s)	How will data be collected (for re-used data: source and terms of use)?	Purpose of processing	Storage location	Who will have access to the data
Literally explanation of the numerical methodologies developed for simulating the behavior of masonry components	.pdf files	Review of the publically available publications	Insight into the research topic, and to provide the basis for the new models developed during the project	OneDrive SURF Drive Project Storage Drive	The project team (the Ph.D. Candidate, Amirhossein Ghezelbash, and the Supervisors, Francesco Messali and Jan G. Rots)
Material properties and test setup of the previously tested masonry constructions	.pdf files .xls files .xlsx files	Review of the publically available publications	Input data and modeling properties for validation of the computational methods used and developed during the project	OneDrive SURF Drive Project Storage Drive	The project team (the Ph.D. Candidate, Amirhossein Ghezelbash, and the Supervisors, Francesco Messali and Jan G. Rots)
Material model and solver codes and software	.for files .cpp files .py files .exe files .msi files .dll files	Development in different coding environments throughout the project	Producing the objectives of the thesis (new/extended material models, solver p[ackages, and analysis solutions)	OneDrive SURF Drive Project Storage Drive Git(lab)	The project team (the Ph.D. Candidate, Amirhossein Ghezelbash, and the Supervisors, Francesco Messali and Jan G. Rots)
Numerical modeling input and output files	Multiple formats based on the employed modeling program	Generating assembled models of the experiments carried out in the literature	Verifying the codes and solutions presented in the literature or under-work during this project	OneDrive SURF Drive Project Storage Drive	The project team (the Ph.D. Candidate, Amirhossein Ghezelbash, and the Supervisors, Francesco Messali and Jan G. Rots)

### 4. How much data storage will you require during the project lifetime?

- 250 GB - 5 TB

## II. Documentation and data quality

### 5. What documentation will accompany data?

- Data will be deposited in a data repository at the end of the project (see section V) and data discoverability and re-usability will be ensured by adhering to the repository's metadata standards
- Data dictionary explaining the variables used
- README file or other documentation explaining how data is organised

## III. Storage and backup during research process

### 6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

- Git(lab)/subversion repository at TU Delft
- OneDrive
- SURFdrive
- Project Storage at TU Delft

The Project Storage Drive will act as the main directory for all files used and generated during the project. All data will be backed up into the drive on a regular weekly basis, or more frequently based on the progress of the work and the urgency of saving the work. Code (and possibly software) generated throughout the project will be uploaded to the Git(lab) repository; A Version Control scheme will protect the files from unintentional modification or loss.

SURFdrive and OneDrive will only be used to store and transfer the material being worked on and is subject to regular change. The most updated version of these files will be saved in the Project Storage Drive at least once a week.

## IV. Legal and ethical requirements, codes of conduct

### 7. Does your research involve human subjects or 3rd party datasets collected from human participants?

- No

### 8A. Will you work with personal data? (information about an identified or identifiable natural person)

*If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice. You can also check with the [privacy website](#) or contact the privacy team: [privacy-tud@tudelft.nl](mailto:privacy-tud@tudelft.nl)*

- No

### 8B. Will you work with any types of confidential or classified data or code as listed below? (tick all that apply)

*If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice.*

- No, I will not work with any confidential or classified data/code

### 9. How will ownership of the data and intellectual property rights to the data be managed?

***For projects involving commercially-sensitive research or research involving third parties, seek advice of your [Faculty Contract Manager](#) when answering this question. If this is not the case, you can use the example below.***

The datasets underlying the published papers will be publicly released following the TU Delft Research Data Framework Policy. During the active phase of research, the project leader from TU Delft will oversee the access rights to data (and other outputs), as well as any requests for access from external parties. They will be released publicly no later than at the time of publication of corresponding research papers.

## **V. Data sharing and long-term preservation**

### **26. What data will be publicly shared?**

- All data (and code) produced in the project
- All validated non-positive results
- All data (and code) underlying published articles / reports / theses

### **28. How will you share your research data (and code)?**

- I will share my data and code via git(lab)/subversion and also create a snapshot in a repository
- All data will be uploaded to 4TU.ResearchData

### **30. How much of your data will be shared in a research data repository?**

- 100 GB - 1 TB

### **31. When will the data (or code) be shared?**

- As soon as corresponding results (papers, theses, reports) are published
- At the end of the research project

### **32. Under what licence will be the data/code released?**

- CC BY-NC

## **VI. Data management responsibilities and resources**

### **33. Is TU Delft the lead institution for this project?**

- Yes, the only institution involved

### **34. If you leave TU Delft (or are unavailable), who is going to be responsible for the data resulting from this project?**

Dr. Francesco Messali ([F.Messali@tudelft.nl](mailto:F.Messali@tudelft.nl)) and Prof. Jan G. Rots ([J.G.Rots@tudelft.nl](mailto:J.G.Rots@tudelft.nl)), my supervisors and collaborators at the 3MD

department in the faculty of Civil Engineering and Geosciences.

**35. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

4TU.ResearchData is able to archive 1TB of data per researcher per year free of charge for all TU Delft researchers. We do not expect to exceed this and therefore there are no additional costs of long-term preservation.