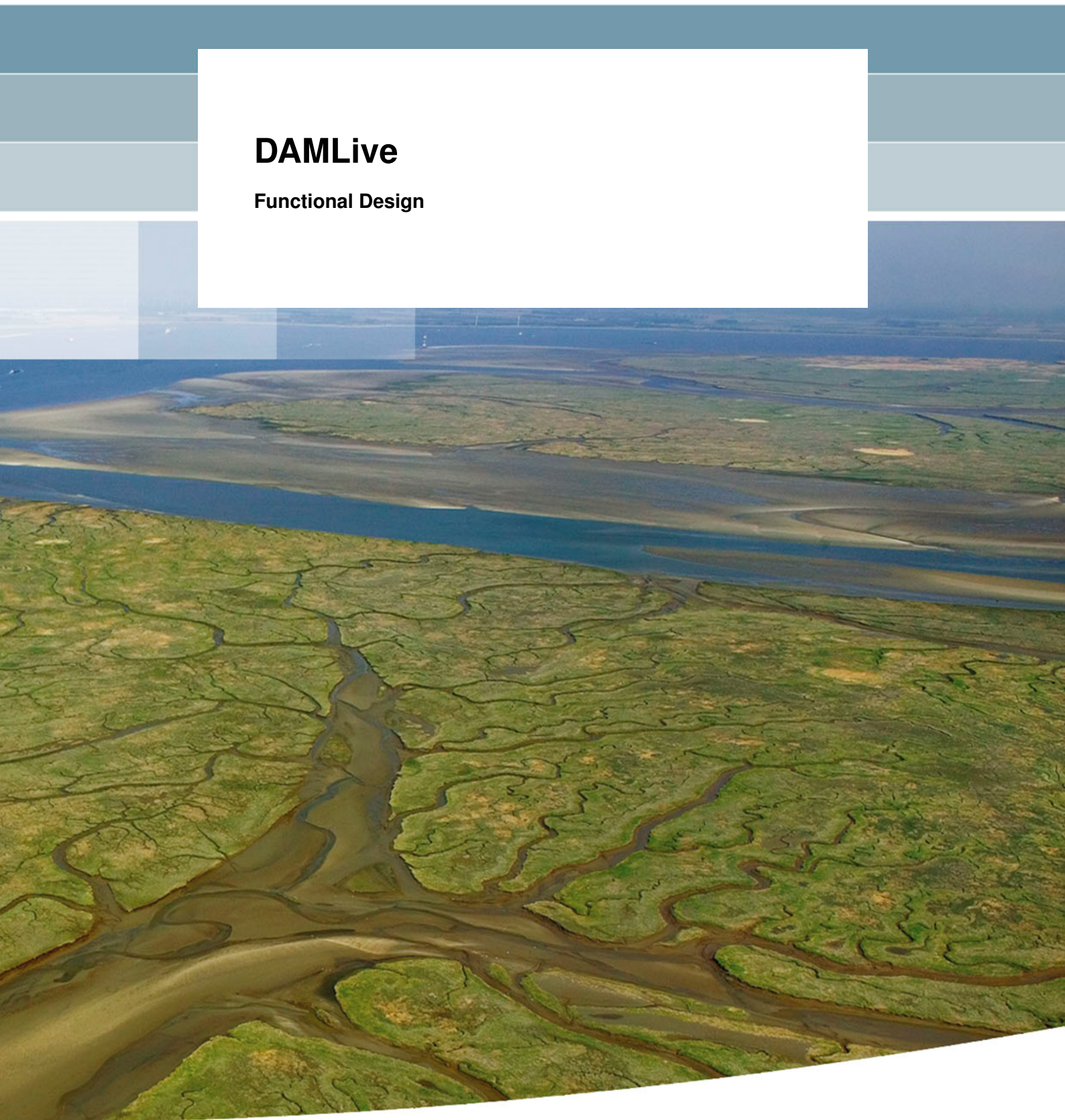


DAMLive

Functional Design



Deltares

DAMLive

Functional Design

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Title

DAMLive

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Dike, safety assessment, monitoring, software, macro stability, piping

Summary

This document contains the functional design for DAMLive, a software module that computes the strength of a complete dike with the use of sensor data and with respect to several failure mechanisms, such as macro stability and piping.

Samenvatting

Dit document bevat het functioneel ontwerp voor DAMLive, een software module die een gebruiker in staat stelt om voor een dijktraject sterkteberekeningen uit te voeren aan de hand van monitoringsdata en voor verschillende faalmechanismen, waaronder macrostabiliteit en piping.

ReferencesRefer to [chapter 3](#).

Version	Date	Author	Initials	Review	Initials	Approval	Initials
0.1	Sep 2018	Irene van der Zwan		Kin Sun Lam André Grijze		Leo Voogt	

Status

draft

This is a draft report, intended for discussion purposes only. No part of this report may be relied upon by either principals or third parties.

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1 Introduction

1.1 Purpose and scope of this document

This document contains the functional design for the DAMLive. The DAMLive is designed for the automated calculation of the strength of dikes with the use of the DAM Engine. DAM was developed by Deltares with and for STOWA for all water authorities. This document describes requirements and functional design of DAMLive. What will actually be implemented depends on the requirements of the clients using this DAMLive. If some functionality is not (yet) needed, then that part does not need to be implemented.

1.1.1 Future options

As mentioned above this document contains some options that will not be implemented in the first release, but are foreseen to be implemented in the near future. Therefore although sometimes a reference will be made to these options, these will not be described in detail yet.

That applies in particular to the following subjects:

- —
- —

1.2 Other system documents

The full documentation on the program comprises the following documents.

Title	Content
DAM Architecture Overall (The, 2017a)	Description of overall architecture of DAM and its components.
DAMLive- Technical Design (The, 2017b)	Description of the implementation of the technical design of DAM Engine.
DAM Engine - Technical documentation (Doxygen, 2017)	Description of the arguments and usage of different software components, generated from in-line comment with Doxygen.
DAM UI - Functional Design (Zwan, 2017b)	Description of the requirements and functional design.
Architecture Guidelines (Kleijn <i>et al.</i> , 2017)	Architecture guidelines that are used by DSC-Deltares.

Table 1.1: DAMLive system documents.

1.3 Document revisions

1.3.1 Revision 0.1

First concept of the document.

2 Functional requirements

Main purpose of DAMLive DAMLive can combine a dam project with sensor data to calculation input for the DAM Engine. The sensor data is provided by an external application, i.e. FEWS. After calculations made by DAM Engine DAMLive can produce an output files with results. These results can be imported by other external applications.

2.1 REQ Data.Input

DAMLive needs a DAM project file (*.damx) and sensordata. The generation of the DAM project file is described in the Functional Design of DAM UI, see (Zwan, 2017b). In this DAM project information containing situation information about the sensors; where are the sensors placed and for which PL-line is the data used.

The sensordata itself (the measurements0 must be provided in xml format. For DAM-FEWS is this described in the FEWS Public Wiki: <https://publicwiki.deltares.nl/display/FEWSDOC/Delft-Fews+Published+Interface+timeseries+Format+Import>.

2.2 REQ Calc.Settings

DAMLive can use the kernels which are used by DAM Engine. Via a xml file ables DAMLive the user to change calculations settings such as failure mechanisms (kernel) and models. The xsd is described in ???. The available failure mechanisms and models are described in the Functional Design of DAM Engine (Zwan, 2017a). Available for DAM live is:

Parameter	Options
Calculation Module	Stability inside Stability outside Piping Bligh PipingWTI PipingSellmeijer
Calculation model	Bishop UpliftVan
Search method	Grid
Use zones	Use of Forbidden zones: yes or no
Forbidden zone factor	Value between 0 and 1

Table 2.1: DAMLive system documents.

2.3 REQ Data.Output

DAMLive can produce output files.

2.4 REQ Save.Project

The DAMLive can save a project.

3 Literature

Doxygen, 2017. *DAM Engine - Technical documentation, Generated by Doxygen 1.8.10*. Tech. rep., Deltares.

Kleijn, E., A. Grijze, H. Elzinga, S. Hummel and T. The, 2017. *Architecture Guidelines*. Tech. rep., Deltares.

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Zwan, I. v., 2017a. *DAM Engine - Functional Design*. Tech. Rep. 1210702-000-GEO-0003, version 0.1, jan. 2017, concept, Deltares.

Zwan, I. v., 2017b. *DAM UI - Functional design*. Tech. Rep. 1207094-000-GEO-0005, Versie 2, 11 juni 2013, concept, Deltares.

Appendix

A Sensor Data format

