Deltares

Test Report DAM 18.1

after refactoring DAM 15.1

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11202121-002

Deltares

Title
Test Report DAM 18.1

Client	Project	Reference	Pages
STOWA	11202121-002	11202121-002-GEO-0003	16

Trefwoorden
Dike, safety assessment, design, software, macro stability, piping

Samenvatting
This document contains the test report of the refactoring of DAM 15.1 into DAM 18.1.2.

Referenties
See chapter 7

Versie	Datum	Auteur	Paraaf	Review	Paraaf	Goedkeuring	Paraaf
	jun. 2018	Irene van der Zwan		Kin Sun Lam		Maya Sule	

State
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.

Content

1 Introduction

1.1 Purpose and scope of this document

This document contains the Test Report for the program DAM that computes the slope stability and/or piping of a dike section. DAM 15.1 is refactored resulting in a seperate DAM UI and DAM Engine. After the refactoring the results from the new DAM 18.1 should be equal to DAM 15.1, except for fixed bugs.
DAM 15.1 was using the D-Geo Stability 15.2 kernel. To use the same kernel in the refactored DAM was an inefficient method. Therefor is decided to connect to the latest D-Geo Stability kernel (18.1). To compare DAM 15.1 was also connected to this kernel. Twelve complete project were calculated with both versions; test 1.
During the refactoring the DAM UI was unchanged. Still the functionality has to be tested since the code of the UI was rearranged, because the refactoring was reorganizing the DAM 15.1 to two separate items: DAM UI and DAM Engine. This testing was done by testing by users on two separate test days (test 2), testing by a single user doing all the tutorials (test 3) and free testing by a developer (test 4).
This Test Report describes the results of the tests that took place before the program is to be released. The tests prove that the quality of the program is sufficient. This document reports the success of the relevant tests.

1.2 Other system documents

The full documentation of the program comprises the documents listed in table below:

Technical Design UI (The, 2017a)	Description of the technical design of DAM UI
Technical documentation UI (Doxygen, 2017a)	Description of the arguments and usage of different software components, generated from in-line comment with Doxygen.
Test Report (this document)	Description of the test results
User Manual (Erik Vastenburg, 2015)	Description of the different functionalites available in the User Interface and background information.
DAM Engine- Architecture Overall (The, 2017b)	Description of overall architecture of the DAM Engine and its components.
DAM Engine- Functional Design (Zwan, 2017)	Description of the requirements and functional design of DAM Engine
DAM Engine- Technical Design (The, 2017c)	Description of the implementation of the technical design of DAM Engine.
DAM Engine- Technical documentation (Doxygen, 2017b)	Description of the arguments and usage of different software components, generated from in-line comment with Doxygen.
Architecture Guidelines (Kleijn et al., 2017)	Architecture guidelines that are used by DSC-Deltares.

Figure 1.1 Documents

1.3 Code coverage

To determine what proportion of the code is actually being tested by coded tests such as unit tests or integration tests, the code coverage feature of Team City (the build server) is used. This tool shows the percentage of the code that was tested in each assembly, class, and method.

Item	Code coverage (Statement)
DAM 15.1	12,5 %
DAM 18.1 UI	42,5 %
DAM 18.1 Engine	79,5 %

Figure 1.2 Code coverage

The big difference can be explained by the fact that Dam 15.1 was one 'container'. The refactoring detached DAM UI from DAM Engine and for DAM 15.1 the DSL-code was included in the code coverage. For DAM18.1 the DSL-code is not in the code coverage.
The refactoring was limited to the DAM Engine; that's why this code coverage is strongly increased.

2 Test 1 Compare Results DAM 15.1 to DAM 18.1

DAM 15.1 was using the D-Geo Stability 15.2 kernel. To use the same kernel in the refactored DAM was an inefficient method. Therefor is decided to connect to the latest D-Geo Stability kernel (18.1). To compare DAM 15.1 was also connected to this kernel. Twelve complete project were calculated with both versions.

2.1 Projects

Data from excisting projects is used to compare the results of DAM 15.1 to the refactored DAM. The complete project is used to test the 'real' behaviour of DAM, when used by the waterboards.

In appendix A the projects are described.

2.2 Results

The calculation made for this test are saved in N:\Projects\11202000\11202121\B. Measurements and calculations\Vergelijk.
In table below the results are given. Found issues are solved before releasing DAM 18.1.

Project	Results	Issue
Invoer1a	DAM 18.1 sometimes results in different RRD-scenarios than DAM 15.1. This is caused by a bug in DAM 15.1; determination of the uplift location was not correct when surfaceline in RD coordinates was not oriented outward-inward.	MWDAM-1219
Invoer1b	No differences	
Invoer2	No differences	
Invoer3	No differences	
Invoer4	DAM 18.1 sometimes results in different RRD-scenarios than DAM 15.1. This is caused by a bug in DAM 15.1; determination of the uplift location was not correct when surfaceline in RD coordinates was not oriented outward-inward.	MWDAM-1219
Invoer5a	Combination Bishop/LiftVan in Design mode is no longer used in DAM 18.1	MWDAM-1220
Invoer5b	No differences	
Invoer6	No differences	
Invoer7	Difference in uplift location due to bug in DAM15.1 (MWDAM-1219).	MWDAM-1227
Invoer8	No differences	
Invoer9	No differences	
Invoer10	No differences	
Invoer11	Difference in hydraulic shortcut calculation due to bug in DAM 15.1 (MWDAM-1219). Difference in safety factor due to bug in DAM15.1 in determination of PL4.	MWDAM-1273 MWDAM-1272

Project	Results	Issue
Invoer12	No differences	

Figure 2.1 Results test 1

3 Test 2 - User test days

During two days in February and April users of DAM 15.1 were invited to test the refactored DAM (development version) with own data.

The findings of the test days are summed in tables below. Every finding results in a Jira-issue. So the key, type and priority of the issue are placed in the table as well.

Key	Summary	Issue Type	Status	Priority
MWDAM-1202	Correction for uplift PL3 is not done	Bug	Closed	Blocker
MWDAM-1201	Error message There are more than two points with the same x coordinate on the surface line	Bug	Closed	Blocker
MWDAM-1200	Different result in Design mode	Bug	Closed	Blocker
MWDAM-1199	Visibility of soilprofiles not available in UI (cross section)	Bug	Closed	Blocker
MWDAM-1190	Incorrect generation of PL4	Bug	Closed	Blocker
MWDAM-1198	Cannot open dam project in 15.1 after opening in 18.1	Bug	Closed	Critical
MWDAM-1197	Progress bar not visible and calculation time is not given	Bug	Closed	Major
MWDAM-1195	Display of safety factor LiftVan without model factor conform D-Geo Stability	Improvement	New	Major
MWDAM-1192	Design: DAM does not increase dike heigth while DTH< Z crest	Bug	Closed	Major
MWDAM-1188	Extra subsoilscenario in DAM 2018 than in DAM release	Bug	Closed	Major
MWDAM-1187	Error message about characteristic points	Bug	Closed	Major
MWDAM-1223	Give new Sf for piping when crest is adepted to DTH	Improvement	Closed	Major
MWDAM-1218	No error message when new shoulder width is smaller than current shoulder width	Bug	Closed	Major
MWDAM-1177	VNK calculation from UI goes wrong	Bug	Closed	Major

Key	Summary	Issue Type	Status	Priority
MWDAM-1169	Show model type for Bishop/UpliftVan calculation in result	New Feature	Closed	Major
MWDAM-1196	No progress bar visible or is very abrupt and calculation time is not given	Bug	Closed	Minor
MWDAM-1191	Selecting locations not always possible	Improvement	In Test	Minor
MWDAM-1185	'Ontwikkelversie' does not show in toolbar	Bug	Closed	Minor
MWDAM-1217	Set calculation result to Failed when shoulder width is larger than allowed	Bug	Closed	Minor
MWDAM-1203	Layout of text export looks different IN DAM 2018 tot DM15.1.2.	Bug	New	Trivial
MWDAM-1194	PDOK does not show (except aerial)	Bug	New	Trivial
MWDAM-1193	Text in splash screen not visible	Improvement	Closed	Trivial
MWDAM-1189	Pop-up of D-Geo Stability during calculating prevents user from working on same machine	Improvement	New	Trivial

4 Test 3 Tester following the tutorials

The tester followed the scripts of the DAM-tutorials, presented in https://repos.deltares.nl/repos/ds/trunk/doc/user_manuals/dike_analysis_module/dike_analysis_module.pdf

The findings are presented in following table.

Manual test and UI	**Adeption**
figuur 1.9: maar 1 zoom optie in het programma ipv 3 in de manual: zoom naar alle kaartlagen	MWDAM-1275 (bug-major-open)
figuur 1.9: basiskaart (PDOK grijs / pastel) staan niet in de manual	Opmerking in manual: Let op de basiskaart van PDOK is tijdelijk niet beschikbaar (2018).
figuur 1.10: andere volgorde in het programma 1, 10, 11, … , 19, **2**, 20, 21, ..	figuur aangepast
figuur 1.11: het knippen icoon zit niet in het programma, eenheid wijzigen wel. Exporteren heeft een ander icoon in het programma	MWDAM-1276 (bug-minor-open)
figuur 1.11: stijghoogte PN is in het programma PL en tabellen heeft andere tabs (validatie, log) ipv (grafieken, meldingen)	MWDAM-1277 (bug-minor-open)
figuur 1.12: de eenheid kN/m3 wordt met superscript weergegeven in het programma	cannot reproduce in DAM UI svn rev#1696 at own machine
figuur 1.13: exporteren heeft een ander icoon	MWDAM-1186 (closed)
figuur 1.14: profiel naam staat niet in de werkbalk	figuur vernieuwd
figuur 1.14: surface line is rood in het programma en de geometrie komt niet overeen	figuur vernieuwd
1.5.2 geen verwijzing naar een figuur	Figuur toegevoegd
1.5.5 meldingen scherm -> validatie scherm	Tekst aangepast
figuur 1.21: andere venster naam en geen miliseconden	Figuur vernieuwd
figuur 1.22: ander export icoon	Figuur vernieuwd
figuur 1.23: export -> exporteren	Tekst aangepast
figuur 2.2: calculation specifications onder eigenschappen wordt niet weergegeven maar wel in het programma (in het engels)	Figuur vernieuwd
figuur 2.3: berekenings resultaat is disabled bij mij in het programma en scenarionaam niet	Figuur vernieuwd
2.1 / 2.2 / 2.3 lokatie -> locatie en onderaan blz 13	aangepast naar locatie
3.1 verander naam wordt niet in de afbeelding weergegeven	Figuur vernieuwd
boven figuur 3.7 mist een spatie DWP_14aan	Tekst aangepast

Manual test and UI	**Adeption**
boven figuur 3.9 de zin begint na de schuin geschreven 'titel' ipv eronder	Tekst aangepast
figuur 3.12: ander resultaat	Figuur vernieuwd
4.1 optie 1, de zin begint op dezelfde regel ipv eronder	Tekst aangepast
figuur 4.1 is in het engels	Figuur vernieuwd
4.2 het tabblad heet validatie, niet meldingen	Tekst aangepast
4.3 een hele dijktraject moet volgens mij een heel dijktraject zijn	Tekst aangepast
geen figuur nummers vanaf blz 28	Tekst aangepast
figuur op blz 31 heeft verkeerde export icoon	
5.1.4.1 Sensor group aan het einde van de zin staat 'bij behoort', volgens mij zou dit 'bij hoort' moeten zijn of tot behoort	Tekst aangepast
5.1.4.3 PLLine-Mapping gebruik -> gebruikt	Tekst aangepast
sensor type water druk druk -> waterdruk	Tekst aangepast

Figure 4.1 Findings tutorials

Most findings were solved by adjusting the text or the figures of the tutorials. Only few findings result in a Jira issue.

5 Test 4 Free testing developer

One of the developers, John Bokma, did free testing of the UI.
His findings are described in Jira issue MWDAM-1263

DSL related: In Map, the PDOK options do not work and are not properly translated. Also, after choosing a PDOK option, the Open Street Map option does not work anymore! I think it is best to remove PDOK al together !?
MWDAM-1194 (bug-trivial-open)

Calculation - Clear Results (after design, adapt geometry) does NOT throw away the designed surface line as shown in the cross section. It should do this.
MWDAM-1269 (bug-minor-open)

After a calculation has been made (Design, Piping), the Calculation tab at Location level shows the scenario name as editable instead of Read Only as it should be. And it even is editable which it should not be.
Test: cannot reproduce in DAM UI SVN rev#1696

Note: Using data for Design Tutorial, Piping, Piping1, I get different results for Bligh and Sellmeijer 4-forces in case of Design, Adapt Geometry. I can not judge Sellemijer VNK without debugging because of its strange behaviour in 18.1 (see Issue ~~MWDAM-1264~~). The WBI calculations fails too (with safety factor = 90 which is very wrong, message says result = NaN (in Dutch! instead of English).
For Design, No Adaption I first got errors for all Sellemeijer models (see ~~MWDAM-1265~~) but after solving that issue, all anwers were the same.
This in itself proves that the differences found are due to the new design method, not due to the kernels themselves.
Tested and closed ~~MWDAM-1264~~ and ~~MWDAM-1265~~

Note 2: The new version is a lot more stable than the 15.1 version. Changing calculation models and recalculating will (after a number of changes lead to errors in 15.1, closing Dam altogether.
Doing the same in the new version does NOT give these problems.

Assessment
According to the description, Current scenario type should be selectable immediately but it is not. Only after calculation, the box becomes available (which is correct; the manual should state thta first the calculation must be started/performed; Chapter 4.4 should be called 'Inzien uitvoer' and not 'Inzien invoer';

Text adapted

In 4.4 it should also b4e mentioned that NOT all scenarios show images and offer the possibility to start DGeostability because these scenarios do not concern DGeostability, p.e. scenario 10 = Piping so no image).
Text adapted

Also the combo-box displaying the actual type is not wide enough for the types to be shown correctly. This should be repaired in the UI.
Irene: cannot reproduce at rekennode V-WCF192.directory.intra, but can reproduce at own machine.
MWDAM-1270 (improvement-major-open)

When scenarios without DGeostability are selected, the Open Calculation button should be disabled!

MWDAM-1214 (improvement-major-open)

6 Conclusion

The quality of DAM 18.1.2. is sufficient for a release.
The code coverage of DAM Engine is enormously increased to 79.5%. The DAM UI is still at
In the UI some minor bugs are present. These are presented in the release notes with a work around, when available. A bigger number of bugs is present, which were already present in version DAM 15.1.

7 Literature

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

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

A

B Test projects test 1

Map	Naam project	Gebied	Modus	Invoer	Coord.	1D/2D	Bijzonderheden	Opmerkingen
Invoer1a	RPS-STBI	Delfland	Toets/Reg	csv&shape	RD	1D	stress tables	
Invoer1b	RPS-STBU	Delfland	Ontwerp/ Reg	csv&shape	RD	1D	stress tables	Grid naar handmatig gezet
Invoer2	Tutorial Design	HSSK	Ontwerp/ Prim	csv	lokaal	2D	oorsprong sti bestand <>0	Let op: Use slope top shouder op FALSE zetten
Invoer3	DeltaDijk normal	Friesland	Ontwerp/ Prim	csv	lokaal	1D		
Invoer4	Balgzandkanaal	HHNK	Toets/Reg	csv	RD	1D		230, 890, 980 en 1080 kunnen niet rekenen.
Invoer5a	Rijnland	Rijnland - Testset 1	Ontwerp/ Reg	csv	lokaal	2D		
Invoer5b	Rijnland	Rijnland - Testset 2	Ontwerp/ Reg	csv	lokaal	2D		
Invoer6	Rijnland	Rijnland	Ontwerp/ Prim	csv	lokaal	2D	Piping zonder piping ondergrond	Piping zonder pipingsegmenten niet mogelijk, check op foutmelding. NB damx openen veroorzaakt crash
Invoer7	Tutorial - Toetsing	HHNK	Toets/Reg	csv&shape	RD	1D	vanaf bestaande damx	
Invoer8	Tutorial - Waterspanningen		Ontwerp/ Prim	csv	lokaal	2D		The dike has an improper shape (p.e. dike top below dike toe) -223-17
Invoer9	Groningen	Groninge n	Ontwerp/ Prim	csv	RD	2D		
Invoer10	Tutorial Design	HSSK	Ontwerp/ Prim	csv	lokaal	2D	1 profiel voor testen Zonetype	
Invoer11	RPS-STBI-24km	Delfland	Toets/Reg	csv&shape	RD	1D	stress tables	
Invoer12	1b. RDD DAM Pilot	Aa en	Ontwerp/	csv	RD	1D		

	Gevoeligheidsanalyse - STBI - Bishop - WS standen - Run Toetsing	Maas	Prim					